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An agency of Industry Canada

CA 2527845 A1 2004/12/16

(21) 2 527 845

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(86) Date de dépôt PCT/PCT Filing Date: 2004/06/01
(87) Date publication PCT/PCT Publication Date: 2004/12/16
(85) Entrée phase nationale/National Entry: 2005/11/30
(86) N° demande PCT/PCT Application No.: US 2004/017391
(87) N° publication PCT/PCT Publication No.: 2004/109489
(30) Priorité/Priority: 2003/06/02 (10/453,046) US

(51) Cl.Int./Int.Cl. *G06F 3/033* (2006.01)

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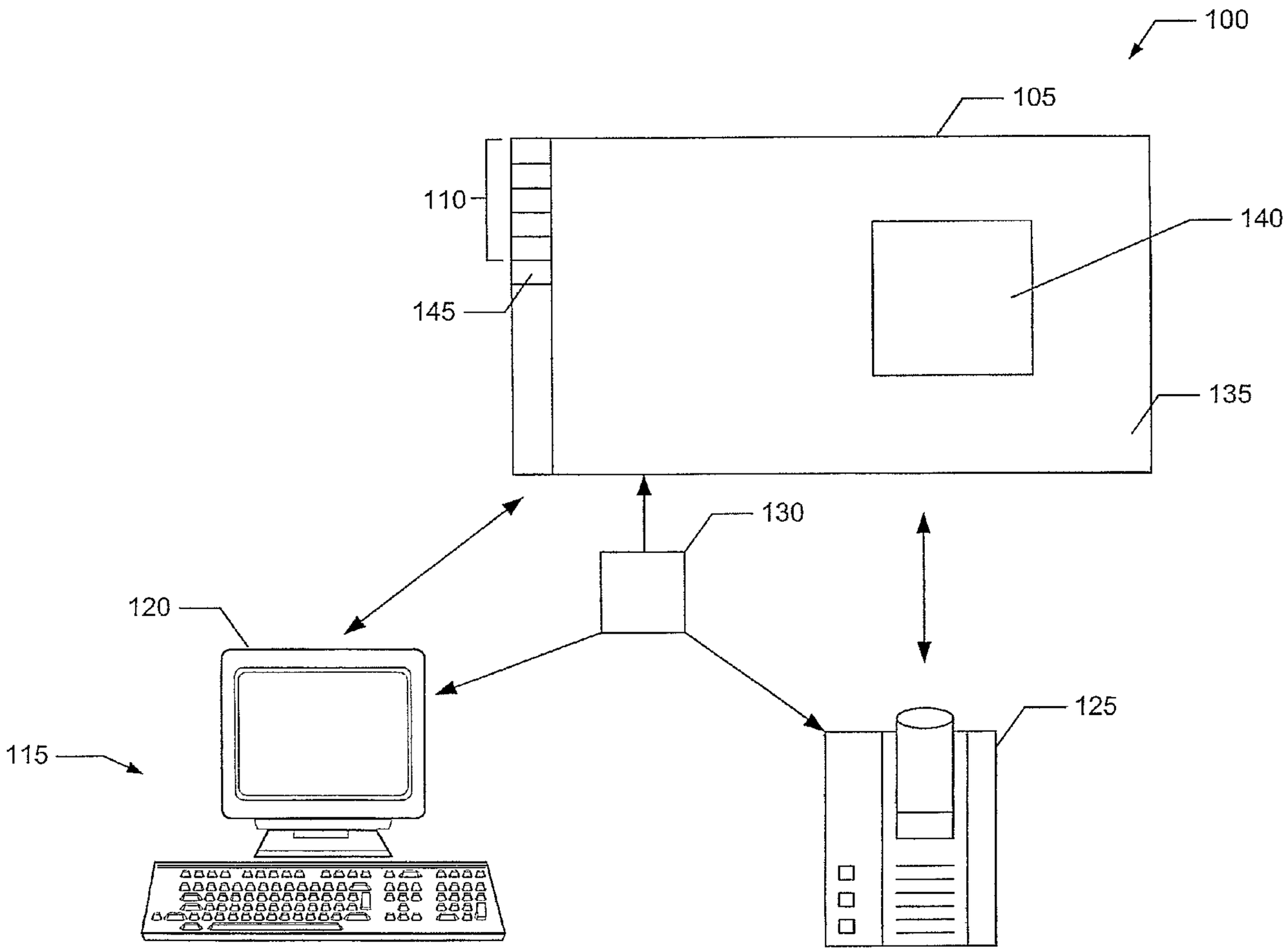
(54) Titre : SYSTEME DE TABLEAU BLANC ELECTRONIQUE COULISSANT
(54) Title: SLIDABLE ELECTRONIC WHITEBOARD SYSTEM



(57) Abrégé/Abstract:
The present invention provides movable visual communication systems, more specifically movable electronic whiteboard systems. The invention provides an electronic whiteboard (105) having at least one positioning member (215) and a guide element (210)

(21) 2 527 845

(13) A1

(57) Abrégé(suite)/Abstract(continued):
adapted to receive the positioning member, wherein the electronic whiteboard and the positioning member are movable along the guide element. The guide element can house an extendable or retractable line (255) that maintains connectivity with the electronic whiteboard at any point along the guide element.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 December 2004 (16.12.2004)

PCT

(10) International Publication Number
WO 2004/109489 A3

(51) International Patent Classification[7]: G06F 3/033

(21) International Application Number:
PCT/US2004/017391

(22) International Filing Date: 1 June 2004 (01.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/453,046 2 June 2003 (02.06.2003) US

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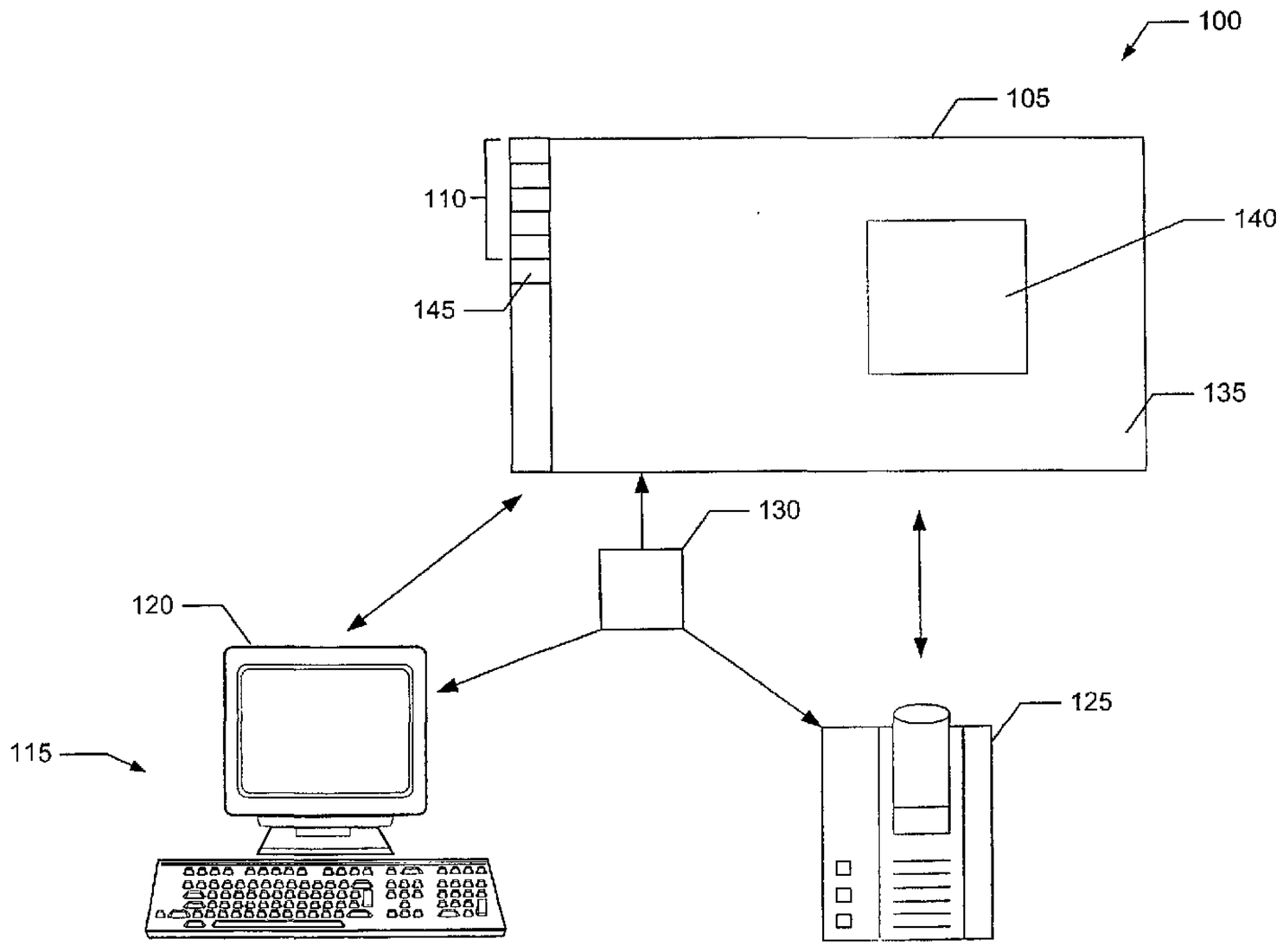
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,

[Continued on next page]

(54) Title: SLIDABLE ELECTRONIC WHITEBOARD SYSTEM



(57) Abstract: The present invention provides movable visual communication systems, more specifically movable electronic whiteboard systems. The invention provides an electronic whiteboard (105) having at least one positioning member (215) and a guide element (210) adapted to receive the positioning member, wherein the electronic whiteboard and the positioning member are movable along the guide element. The guide element can house an extendable or retractable line (255) that maintains connectivity with the electronic whiteboard at any point along the guide element.

WO 2004/109489 A3

WO 2004/109489 A3

ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
7 April 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

SLIDABLE ELECTRONIC WHITEBOARD SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to the field of visual communication systems, and more particularly to electronic whiteboards and movable interactive electronic whiteboard systems.

2. Description of Related Art

Electronic whiteboards provide many benefits to users during lectures, meetings, and presentations. During meetings and presentations, not only do electronic whiteboards allow users to present electronic presentations, electronic whiteboards also permit handwritten notes on the whiteboard to be saved electronically for future reference.

In the classroom setting, electronic whiteboards are advantageous as they provide educators with a modern and user-friendly teaching tool. Educators prefer electronic whiteboards because of their versatility. Electronic whiteboards allow educators to project virtually any text and images onto the whiteboard as well as write along side of any projected image and markup projected images with electronic ink.

Although electronic whiteboards are increasing in popularity, using electronic whiteboards in existing settings is problematic because of existing visual aids and limited wall space in the front of classrooms. For example, classrooms typically have visual aid devices such as charts, markerboards, maps, and information placed on a wall in the front of the class. Thus, in some existing classrooms and auditoriums, additional visual communication devices such as electronic whiteboards may not have sufficient space to be installed. Installing an electronic whiteboard may require removal of an existing visual aid. Rather than remove existing visual communication devices, a user may desire to combine the use of electronic whiteboards with existing visual aid devices including stationary dry-erase whiteboards, chalkboards, or tackboards.

Current methods of solving this problem include mobile electronic whiteboards, wherein the electronic whiteboards are free-standing and not secured to a wall. Thus, these mobile electronic whiteboards have their own stands and power cords, which are safety hazards because people can easily trip over the cords and the stands. Also, these electronic whiteboards are inconvenient because a larger amount of space is needed to store these mobile units.

Thus, there is a need for movable electronic whiteboard systems, and a further need

for positionable electronic whiteboard systems that are compatible with existing room structures.

Therefore, it can be seen that a need yet exists for track systems for movable electronic whiteboard systems. It is to such a system that the present invention is primarily directed.

BRIEF SUMMARY OF THE INVENTION

The present invention provides movable visual communication systems. Although the present invention will be described with reference to an electronic whiteboard system, it will be appreciated that the invention encompasses aspects of other types of visual communication systems, including but not limited to, interactive visual communication systems, whiteboards, chalkboards, plasma displays, message boards, and distributed computing networks. Accordingly, one aspect of the present invention provides a movable electronic whiteboard system having an electronic whiteboard with at least one positioning member. The system also includes a guide element adapted to receive the positioning member. Additionally, the electronic whiteboard and the positioning member can be movable along the guide element, wherein the electronic whiteboard and positioning member can be positioned along the guide element by applying an amount of force to the electronic whiteboard - causing the electronic whiteboard to change its position, for example sliding the electronic whiteboard along the guide element.

Another aspect of the invention is directed to a track system for an electronic whiteboard. The track system includes a guide element adapted to receive a positioning member of an electronic whiteboard. The guide element is capable of receiving the positioning member along a length of said guide element. By receiving the positioning member of the electronic whiteboard, the guide element and the electronic whiteboard are operatively connected so that the electronic whiteboard can be positioned along the length of the guide element. When the guide element is fastened to a wall, for example, the guide element supports the electronic whiteboard. The guide element can also house a power communicator, for example a retractable line including a coiled or spooled line, for connecting the electronic whiteboard with a power source. The line can be configured such that a connection with the electronic whiteboard is maintained at any position of the electronic whiteboard along the length of the guide element. Housing the line in the guide element helps reduce or eliminate the number of exposed or exterior lines that can cause clutter, and to prevent obstacles to users.

Yet another aspect of the present invention provides a track system for an electronic

whiteboard having a guide element adapted to receive an electronic whiteboard so that the electronic whiteboard is positionable on said guide element. The guide element can house an extendable line. The extendable line can maintain connectivity with the electronic whiteboard and the track system independent of the position of said electronic whiteboard on the guide element while remaining housed within the guide element. The guide element can also conduct or transmit power or data to or from the electronic whiteboard as necessary.

BRIEF DESCRIPTION OF THE FIGURES

Fig. 1 is an exemplary system diagram of a movable electronic whiteboard system in accordance with a first embodiment of the present invention.

Fig. 2A is a cross sectional view of a side of a movable electronic whiteboard system mounted above an existing whiteboard in accordance with a first embodiment of the present invention.

Fig. 2B is a cross-sectional exploded view of the top portion of a track system for a movable electronic whiteboard system in accordance with an exemplary embodiment of the present invention.

Fig. 2C is a view of the electrical coiled cable within a piston in accordance with a first embodiment of the present invention.

Figs. 3A and **3B** are a graphical representation of an exemplary movable electronic whiteboard track system mounted above an existing whiteboard, wherein a portion of the housing is removed.

Fig. 3C is an exemplary wall jack embodiment of the present invention.

Fig. 4 is a cross-sectional view of a movable electronic whiteboard system in accordance with another exemplary embodiment of the present invention.

Fig. 5 is a top view of an end of an exemplary movable electronic whiteboard system in accordance with another exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the above figures, wherein like reference numerals represent like parts throughout the several views, the apparatus and system for a movable electronic whiteboard system will be described in detail.

Electronic Whiteboard Systems

Fig. 1 depicts an exemplary electronic whiteboard system **100** of the present invention. The electronic whiteboard system **100** includes an electronic whiteboard **105** operatively connected to a processing device **115**. Processing device **115** can be an

integrated component of the electronic whiteboard, or processing device **115** can be an external component. Suitable processing devices include computing devices such as personal computers.

Electronic whiteboards **105** are known in the art and can receive input from a user in a variety of ways. For example, electronic whiteboards **105** can incorporate capacitance technology and receive input from a user via an electrically conductive stylus. The stylus can be a writing implement including a finger. An exemplary stylus can transmit a signal to electronic whiteboard **105** indicating the location of the stylus in relation to a surface of electronic whiteboard **105**. The stylus can also transmit other information to electronic whiteboard **105** including but not limited to pen color, draw or erase mode, line width, font or other formatting information.

In another embodiment, electronic whiteboard **105** can be touch sensitive or pressure sensitive. Touch sensitive or pressure sensitive means having the capability to convert a physical contact into an electrical signal or input. Touch sensitive electronic whiteboards can incorporate resistive membrane technology. See for example U.S. Patent No. 5,790,114 to Geaghan et al. describing resistive membrane electronic whiteboards, and which patent is incorporated herein in its entirety.

In one embodiment, electronic whiteboard **105** has two conductive sheets physically separated from one another, for example by tension, such that the two sheets contact each other in response to a touch or physical pressure. The sheets are made of a conductive material or can be coated with a conductive material such as a conductive film, and can be deformable. Touching, writing, or other application of pressure on the surface of the conductive sheets causes contact between the two conductive sheets resulting in a detectable change in voltage or resistance. The sheets can act as resistance dividers and a voltage gradient can be created by applying different voltages at the edges of a sheet. The change in voltage or resistance can then be correlated to a location value, for example a Cartesian coordinate set. Coordinate data, for example (x,y) pairs or their equivalent, can be transmitted to processing device **115** in compatible data packets, for processing, manipulating, editing, or storing.

Other embodiments for an electronic whiteboard **105** include laser-tracking, electromagnetic, infrared, camera-based systems, and so forth. These systems detect the presence of ink markings or a pointer or stylus device across a two-dimensional surface, which can be enabled for erasure of marks made with a dry-erase maker, but do not have to be.

Conventional dry-erase markers are typically used to write on a surface of electronic whiteboard **105**, but other erasable or removable ink, pigment, or coloring can be used to physically mark a surface of electronic whiteboard **105**. The physical markings on electronic whiteboard **105** can be removed using conventional methods including an eraser, towel, tissue, hand, or other object that physically removes the markings from the surface of electronic whiteboard **105**.

Electronic whiteboard **105** can also include a control area **110**. Control area **110** can contain multiple control areas **145** (for example a button or a soft key) for controlling a function of the electronic whiteboard system **100**. Control area **110** can be an actuator, for example a physical button **145**, that can be actuated by applying pressure to control area **110**. The function of control area **110** can be fixed or variable. If the function of control area **110** is variable, control area **110** can comprise a soft key **145** whose function can be controlled by processing device **115**. For example, soft key **145** can have different functions depending on different application software running on processing device **115**. An image or icon can be projected near control area **110** indicating the current function of a soft key **145** using a projecting device **125**.

Projecting device **125** can be operatively connected to processing device **115**, whiteboard **105**, or both. Projecting device **125** can be a conventional projecting device for projecting a graphical user interface typically on a display **120** of the processing device **115** onto a surface **135** of the electronic whiteboard **105**. Projecting device **125** can adjust for image distortions including keystoning and other optical problems, for example optical problems arising from the alignment of a projected image on surface **135** with the graphical user interface on display **120**. Alternatively, processing device **115** can adjust for image or alignment problems. A user can also physically adjust projecting device **125** to compensate for image problems including keystoning.

Another embodiment of the present invention includes a plasma display or rear-projection system with a coordinate-detecting surface, such as a touch-sensitive, capacitive, camera-based, laser-tracking, electromagnetic, or others, whereby a stylus can be tracked on the surface and the video source is provided by the processing device **115**. Laser-tracking technology can require specially coded pens or styluses. Laser-tracking technology utilize optical tracking interfaces using infrared lasers that track these specially coded pens or styluses as they move across the board. Regardless of the projection screen used, those present can view everything drawn on the projection screen, while the processing device captures what is drawn on the screen. Examples of laser tracking electronic whiteboards

include the Webster™ Laser Tracking (LT) Series of interactive whiteboards manufactured by PolyVision Corporation, Norcross, Georgia. Other electronic whiteboard technologies include ultrasonic pen tracking, infrared pen tracking, electromagnetic pen tracking, and others.

Electronic whiteboard system **100** can also include remote control device **130** that can be in communication with the electronic whiteboard system **100**, or a component thereof. For example, remote control device **130** can be in communication with electronic whiteboard **105**, processing device **115**, projecting device **125**, or a combination thereof. Communication between remote control device **130** and another component of the system **100** can be by electromagnetic technology, including, but not limited to, infrared or laser technology. Additionally, communication between remote control device **130** and electronic whiteboard system **100** can be by conventional wireless, radio, or satellite technology.

Movable Electronic Whiteboard Systems

Figs. 2A-2C depict cross sectional views of an exemplary movable electronic whiteboard system **200** according to one embodiment of the present invention. Generally, system **200** enables an electronic surface, for example an electronic whiteboard **105**, digitizer, or the like, to be movably positioned along a surface such as a classroom wall. Movable electronic whiteboard system **200** includes a guide element **210**, a positioning member **215**, a first channel **220**, a second channel **225**, a retention member **230**, and a guard member **235**.

Guide element **210** can be mounted to a wall thereby permitting electronic whiteboard **105** to be movably positioned at various locations on the wall by moving electronic whiteboard **105** along guide element **210**. Once electronic whiteboard **105** is moved to a desired position, electronic whiteboard **105** can be temporarily fixed at that location on guide element **210** with a securing means. In another embodiment, guide element **210** can be positioned with existing wall structure **212** so that electronic whiteboard **105** can be used in combination with existing wall structure **212**. Exemplary existing wall structures include stationary whiteboards, chalkboards, tack boards, message boards, charts, maps, screens, or the like. Guide element **210** can be installed directly above, below, or beside existing wall structure **212**, or alternatively, guide element **210** can be installed directly on top of such existing structure. When installed above or directly on top of one of these existing structures, the structures can still be used for their normal functions. For example, if a movable electronic whiteboard system **200** is installed directly on top of a

chalkboard, both the electronic whiteboard **105** connected to guide element **210** and the chalkboard can be used in conjunction with one another. As electronic whiteboard **105** is moved along the length of the guide element **210**, parts of the chalkboard or other wall structure can be exposed or concealed as needed.

Guide element **210** can be secured to the wall or to the surface of an existing structure by a suitable means, including for example, fasteners such as bolts, nails, screws, solder, or glue. In another embodiment, the guide element **210** can be embedded in the wall such that the front of the guide element **210** is flush with the surface of the wall.

Guide element **210** supports the weight of the electronic whiteboard **105**. Thus, guide element **210** can be made of a durable substance, including but not limited to metal, metal alloys, woods, glasses, and plastics. In an exemplary embodiment, guide element **210** is made of a metal, such as aluminum or steel.

Electronic whiteboard **105** can be placed at various distances from guide element **210** depending on the length of positioning member **215**. Distance $\mathbf{d_1}$ defines the space between guard member **235** of guide element **210** and electronic whiteboard **105**; however, the guide element **210** and the back of the electronic whiteboard **105** can be in physical contact with one another. If the guide element **210** and the electronic whiteboard **105** physically touch one another, then the coefficient of friction between the two elements should be low enough so that the electronic whiteboard **105** can move along the guide element **210** without significant resistance. Moreover, this distance $\mathbf{d_1}$ can be greater than zero if the length of positioning member **215** is greater than $\mathbf{d_1}$. In a preferred embodiment, distance $\mathbf{d_1}$ is a distance sufficient to maintain electronic whiteboard **105** in a substantially vertical orientation when positioning member **215** is positioned in guide element **210**.

The shape of the guide element **210** can be defined by retention member **230** and guard member **235**. As shown in **Fig. 2B**, retention member **230** and guard member **235** can be contoured. It will be appreciated that retention member **230** and guard member **235** can be flat or of other shapes sufficient to maintain positioning member **215** in channel **220** when the system is mounted on a wall. The back of the guide element **210** can be flat such that when it is secured to a surface, it is secured flush against the surface. However, the back of the guide element **210** can have other shapes as needed to fit to the shape of the surface to which it is to be attached.

As noted, retention member **230** can be curved or straight and can extend downward towards the base of the guide element **210**. The angle of the retention member **230** with respect to the vertical axis of guide element **210** preferably can be between 0 and 90

degrees. Guard member **235** can have a straight or a curved profile. However, the guide element **210** can have other shapes, including but not limited to, L-shaped and C-shaped.

Guide element **210** can be of desired length and is preferably longer than the length of electronic whiteboard **105**. Electronic whiteboard **105** can be movably positioned along the guide element **210** by sliding, pushing, or otherwise moving electronic whiteboard **105**. Electronic whiteboard **105** can then be secured, for example temporarily secured, at a desired position along guide element **210**. Electronic whiteboard **105** can be secured on the guide element **210** such that it can move in a direction along the guide element including but not limited to horizontally, vertically, diagonally, or along an arc.

As shown in an exemplary embodiment in **Fig. 2B**, electronic whiteboard **105** has a positioning member **215**. Positioning member **215** connects the back of the electronic whiteboard **105** to surface **240** of channel **220** of guide element **210**. Positioning member **215** can be secured to the back of electronic whiteboard **105** by suitable means, including for example, fasteners such as bolts, nails, screws, solder, glue, or other durable substance. Alternatively, positioning member **215** can be a part of electronic whiteboard **105**. Positioning member **215** can be placed on surface **240** of channel **220** such that positioning member **215** can be positioned at points on the surface **240** of channel **220**, thereby also positioning electronic whiteboard **105** at a point along guide element **210**. Positioning member **215** can be positioned at a point on surface **240** of channel **220** by sliding, rolling, or otherwise moving across surface **240**. Bearings, pulleys, or a motor can also be used to move electronic whiteboard **105**. Moving electronic whiteboard **105** along guide element **210** can be automated, computer controlled, or powered.

In an exemplary embodiment, positioning member **215** can be a combination of a wheel **245** and an axle **250**, such that positioning member **215** can roll across or along surface **240** of channel **220** of guide element **210**. Axle **250** can be secured to the back of electronic whiteboard **105** at one end and have wheel **245** at the other end such that wheel **245** can roll along surface **240** of channel **220** of guide element **210**. This combination of a wheel **245** and axle **250** can be one unitary component, or it can be separate components.

In another embodiment, axle **250** can have a length greater than distance $\mathbf{d_1}$ such that wheel **245**, which is connected to axle **250**, can come into contact with surface **240** and can freely roll along the length of surface **240** of channel **220**. In this exemplary embodiment, axle **250** can be made of durable material, including but not by way of limitation, metals, woods, metal alloys, plastics, and glasses. In an exemplary embodiment, wheel **245** is made of a plastic or other material with a low coefficient of friction. However, other material can

be used to construct wheel **245**, including metal, metal alloys, glass, wood, or rubber. Additionally, guide element **210** can be lubricated to provide a lower coefficient of friction. Alternatively, the positioning member **215** can be a rod such that rod fits within the first channel **220** to facilitate moving electronic whiteboard **105** along guide element **210**.

Additionally, a plurality of wheels **245**, in conjunction with a plurality of axles **250**, can be used to enable movement of the electronic whiteboard **105** along guide element **210**. Moreover, the combination of wheels **245** and axles **250** can support a portion of the weight of electronic whiteboard **105**. Thus, a sufficient number of wheels **245** and axles **250** used should be sufficient to distribute the weight of the electronic whiteboard **105**.

In still another embodiment, positioning member **215** can be operatively connected to a motor such that electronic whiteboard **105** can move along the length of guide element **210** automatically. A user can simply flip a switch or press a button on or around the electronic whiteboard system **100**, or use a remote control to position the electronic whiteboard **105** at a point on guide element **210**. Additionally, positioning member **215** and the motor can be networked to processing device **115** such that processing device **115** can control the positioning of electronic whiteboard **105**.

To prevent electronic whiteboard **105** from becoming inadvertently detached from guide element **210**, a guard member **235** can be used. Guard member **235** can be located near the edge of surface **240** of channel **220** and can extend upwards towards positioning member **215** to prevent positioning member **215** from sliding or being pulled off of guide element **210** laterally. In an exemplary embodiment, guard member **235** can be a rim that is contiguous with guide element **210** and extends vertically upward towards positioning member **215** but does not physically touch positioning member **215**. Alternatively, guard member **235** can physically touch positioning member **215**, but does not significantly impede the movement of the positioning member **215**. Guard member **235** can also be a separate element constructed of a durable material that attaches to guide element **210**.

Guard member **235** can also have a curved profile, which can be compatible with other media, such as maps, flipcharts, hooks, and shelving such that when electronic whiteboard **105** is not secured to guide element **210**, the other media can be secured to guard member **235**. Alternatively, when electronic whiteboard **105** is secured to guide element **210**, these other media can be positioned beside electronic whiteboard **105** or anywhere along the length of guide element **210**. Additionally, electronic whiteboard **105** itself can have an area, for example along its top, that preserves the profile such that these other media can be secured directly on top of electronic whiteboard **105**.

Just as guard member **235** can be used to keep the lower end of positioning member **215** on guide element **210**, retention member **230** can be used to keep the upper end of positioning member **215** on guide element **210**. Retention member **230** extends at an angle from the top of guide element **210** downwards toward positioning member **215**. Retention member **230** can be curved or retention member **230** can extend diagonally downwards towards positioning member **215**. Retention member **230** can extend sufficiently downwards to prevent positioning member **215** from being detached from guide element **210**. The angle of retention member **230** can be large enough such that retention member **230** extends over or partially over positioning member **215**. If positioning member **215** is relatively narrow, then an extender can be connected to the back of positioning member **215** to increase the width of the positioning member **215** such that retention member **230** can extend over a greater area of positioning member **215**. Thus, the angle of retention member **230** preferably can be between 0 and 90 degrees.

In yet another embodiment, guide element **210** includes channel **225** that can house a line **255**, which can include an electrical cable **265**. Piston **260** can be positioned inside channel **225** of guide element **210** to contain electrical cable **265** and to facilitate the coaxial movement of electrical cable **265** through guide element **210**. Piston **260** can also aid in preventing line **255** from protruding from guide element **210**. Thus, piston **260** can be a cylinder with a hollow shaft perpendicular to the length of the cylinder, as shown in **Fig. 2C**. Piston **260** can be, for example, a hollow plastic cylinder, which is six inches long and one inch in diameter. However, the cylinder of piston **260** can be as wide as channel **225** and can be constructed of a suitable material, including but not limited to, plastics, metal, wood, glass, or other suitable material.

Within the hollow portion of piston **260**, an electrical cable **265** supplying both power and data can be housed. Electrical cable **265** can enter piston **260** from one end and can exit piston **260** through the shaft, as depicted in **Fig. 2C**. In an exemplary embodiment, electrical cable **265** is coiled with ends that are straight. A straight end of electrical cable **265** enters piston **260** through an opening at one end of piston **260** and exits piston **260** through a second opening that is perpendicular to the first opening. Electrical cable **265** then connects to electronic whiteboard **105** to supply both power and data to electronic whiteboard **105**. In an exemplary embodiment, electrical cable **265** is a serial cable; however, electrical cable **265** can be a variety of cables, including, but not limited to, Universal Serial Bus (USB) cable, coaxial cable, and parallel cable. Alternatively, two separate cables, running parallel to or separate from each other, can be used: one to supply

power and one to supply data. It should be understood, however, that other numbers of cables can be used without deviating from the scope of this invention.

As shown in **Figs. 3A** and **3B**, electrical cable **265** in an exemplary embodiment is collapsible, extendable, or retractable. Electrical cable **265** can be a coiled cable. An exemplary retractable cable includes a cable on a reel or a spool.

In one embodiment, electrical cable **265** is housed within channel **225** of guide element **210**. If electrical cable **265** is coiled, then electrical cable **265** in its compressed state can be stored at a first end of guide element **210**. The first end is typically closest to a power outlet, electrical coupling, or attached computer. However, even in its compressed state, electrical cable **265** retains a length. The length of the compressed electrical cable **265** can be defined by the length of electronic whiteboard **105**. Thus, electrical cable **265** in its extended state can have a length defined as a function of the length of electronic whiteboard **105** and as a function of the radius of channel **225**. In one embodiment, the length of electrical cable **265** can be limited by approximately $2*L*\pi*r$, where **L** is the length of electronic whiteboard **105** and **r** is the radius of channel **225**. This limitation could be overcome if cable **265** double-backs on itself or if electrical cable **265** is stored in layers in the guide element **210**. In an exemplary embodiment, the length of electrical cable **265** in its extended state is as long as the length of guide element **210**.

In another embodiment, compressed electrical cable **265** is housed in a first end of guide element **210**. Electronic whiteboard **105** can have a starting position on guide element **210** when electrical cable **265** is fully compressed. At this starting position, a first end of electronic whiteboard **105** is flush with a first end of guide element **210**. Typically, compressed electrical cable **265** can have a first end attached to electronic whiteboard **105** at a second end of electronic whiteboard **105** distal to the first end of guide element **210**. Moving electronic whiteboard **105** along guide element **210** away from the first end of guide element **210** can cause compressed electrical cable **265** to relax and extend to maintain a connection with electronic whiteboard **105** as electronic whiteboard **105** is moved along guide element **210**. In another embodiment, electrical cable **265** has a maximum coiled length defined by the length of electronic whiteboard **105**. Moving electronic whiteboard **105** towards the first end of guide element **210** can cause electrical cable **265** to retract or return to a coiled configuration within guide element **210**. As electronic whiteboard **105** is moved along guide element **210**, electrical cable **265** remains housed in guide element **210**.

At the first end of guide element **210** housing coiled electrical cable **265**, a second

end of electrical cable **265** exits guide element **210**. In an exemplary embodiment, electrical cable **265** exits through the back of the guide element **210** and into the wall, where it runs behind the wall and connects to an outlet, for example a power source. Alternatively, a power source can be contained within guide element **210** itself such that electrical cable **265** can be conductively connected to a power source that is either wholly or partially contained within guide element **210**. The power source can be an electrical outlet, or alternatively, the power source can be a battery, a solar panel, a generator, or other device or apparatus, or a combination thereof, that can supply power.

In still another embodiment, a single USB cable **265** can be used to supply both power and data to electronic whiteboard **105** and to supply data to the processing device **115**. Alternatively, serial cable **265** can be used to supply both data and power to electronic whiteboard **105** and USB cable **310** can supply data to the processing device **115**. In this embodiment, a converter **305** can be used to convert the signal carried by the serial cable **265** to a converted signal that can be carried by the USB cable **310**. The placement of the converter **305** can be at numerous locations along the system; however, in an exemplary embodiment, converter **305** can be placed near an electrical outlet. The existing wall jack **320** can be adapted so that there is an electrical outlet **325** as well as a USB port **330**. Thus, the serial to USB converter **305** can be placed behind the wall jack **320** of an existing electrical outlet. The serial electrical cable carrying data from electronic whiteboard **105** enters serial to USB converter **305**. Exiting the serial to USB converter **305** through wall jack **320** is a USB **310** cable carrying data from electronic whiteboard **105**. This USB cable **310** can connect to processing device **115**. The placement of the serial to USB converter **305** is convenient because a processing device **115** can receive both data from a USB cable and power from a single location. An exemplary wall jack **320** is shown in **Fig. 3C**. The advantage of this wall jack **320** maximizes the cable distance, since USB cables are limited to five meters. However, the placement of the converter **305** can be at a location that is accessible to the electronic whiteboard system **100**. Those skilled in the art will understand that any commercial serial to USB converter can be used, including for example, one as described in U.S. Patent No. 6,434,644 to Young et al., which is hereby incorporated by reference in its entirety.

Referring back to **Fig. 2**, a wheel assembly **270** can be located near the base of electronic whiteboard **105**. Wheel assembly **270** helps maintain electronic whiteboard **105** in a substantially vertical orientation. Wheel assembly **270** can slide or roll along the

surface of a wall or other existing structure as electronic whiteboard **105** is moved along the length of guide element **210**.

Fig. 4 is a cross-sectional view of a movable electronic whiteboard system **400** of an electronic whiteboard **105** according to another exemplary embodiment of the present invention. This embodiment is similar to movable electronic whiteboard system **200** except for the shape of the guide element **410**. The top of guide element **410** is open forming a channel **480** that can receive mounting brackets for visual media to be used in conjunction with electronic whiteboard **105**. Charts, graphs, maps, flipcharts, static whiteboards, flag holders, etc. can be mounted over guide element **410** or clipped onto retention member **230**. Additionally, the bottom of guide element **410** can be open forming a channel **485** that can engage existing wall structures **212** such as chalkboards or charts could also be used to hold paper or flipchart pads. The bottom of guide element **410** can also house a securing element **490**, wherein securing element **490** secures other media such as maps, charts, papers or other exhibit to the guide element **410**. Securing element **490** can be a nylon roller or a paper clip or other means to secure the medial to guide element **410**.

Fig. 5 is a top view of one end of movable electronic whiteboard system **200** depicting end cap **505**, shock absorber **510**, and a stopper. End cap **505** can be fastened to the guide element **210** by suitable means including, for example, screws, nails, bolts, glue, or solder. If, for example, screws, nails, or bolts are used, then studs can be used to receive the fasteners to secure the end cap **505** to the guide element **210**. End cap **505** can be a piece of plastic secured to the guide element **210** at each end so that the internal components of the track system **200** are contained. However, other material can be used as an end cap **505**, including but not limited to, glass, metal, rubber, cardboard, wood, cloth, or other material that can contain internal components of the track system **200**.

Fig. 5 also shows a shock absorber **510**. As electronic whiteboard **105** moves along guide element **210** and reaches an end, shock absorber **510** prevents electronic whiteboard **105**, and specifically piston **260**, from reaching the end cap **505** and absorbs energy resulting form electronic whiteboard **105** impacting shock absorber **510**. Shock absorber **510** can be constructed of a material strong enough to absorb a large amount of force without dislodging from the guide element **210**. Thus, in an exemplary embodiment, the shock absorber **510** is constructed of rubber, silicon, plastic or metal fastened to the guide element **210**.

An optional stopper, not shown in the figures, can be placed at each end of the positioning member **215** to prevent positioning member **215** from coming into contact with

the shock absorber **510**. The stopper can be constructed of material such as rubber or silicon to absorb the shock from when the electronic whiteboard **105** reaches the shock absorber **510** and to prevent damage to positioning member **215**.

Other optional elements can be used with the movable electronic whiteboard system **200**. For example, a locking mechanism can be used to secure electronic whiteboard **105** to a fixed location along the length of guide element **210**. The locking mechanism can be a brake, an impedance or obstruction on the guide element, or other mechanical or electrical device that can prevent electronic whiteboard **105** from moving along the guide element **210**. The locking mechanism can be manually placed or a user could also electronically activate the locking mechanism. Additionally, processing device **115** can be used to send a command to movable electronic whiteboard system **200** such that the locking mechanism actuates. The locking mechanism can also be automatic such when electronic whiteboard **105** stops moving along guide element **210**, the locking mechanism actuates and prevents the electronic whiteboard from moving any further unless the user electronically permits further movement of electronic whiteboard **105**.

In another embodiment, guide element **210** itself can be electrically conductive. In this embodiment, electronic whiteboard **105** can continuously maintain a contact with a power source. An insulator can be used to cover the outer surface of guide element **210** to prevent users or others from being shocked by the electrically enabled guide element **210**. Low voltage can also be used.

Additionally, more than one guide element **210** can be used. For example, one guide element **210** can be attached to a surface such that guide element **210** is horizontal to the floor. Another guide element **210** can be attached to a surface such that the length of guide element **210** is perpendicular to the floor. In this embodiment, the electronic whiteboard **105** can move horizontally along one guide element **210**, and then vertically along the other guide element **210**. Thus, several guide elements **210** can be attached to a surface in various directions such that the electronic whiteboard can move in various directions. Additionally, the guide elements **210** can be tiered such that several electronic whiteboards **105** can positioned on top of one another.

While the invention has been disclosed in its preferred forms, it will be apparent to those skilled in the art that many modifications, additions, and deletions can be made therein without departing from the spirit and scope of the invention and its equivalents as set forth in the following claims.

What is claimed is:

1. Visual communication system, comprising:

a powered communication device adapted to be located on a surface,

a track system adapted to be attached to the surface and adapted to enable relative movement between the powered communication device and the surface via the track system.

2. Visual communication system according to claim 1, wherein the communication device comprises an electronic whiteboard.

3. Visual communication system according to claim 1 or 2, wherein the communication device comprises at least one positioning member, and wherein the track system comprises a guide element adapted to receive the positioning member, wherein the communication device and the positioning member are movable along the guide element.

4. Visual communication system according to claim 3, further comprising a computing device operatively coupled to the communication device.

5. Visual communication system according to claim 3 or 4, wherein the guide element is adapted to conduct data to or from the communication device.

6. Visual communication system according to claim 4, wherein the guide element is adapted to conduct data between the communication device and the computing device.

7. Visual communication system according to any of claims 3-6, wherein the guide element is adapted to transmit power to the communication device.

8. Visual communication system according to any of claims 3-7, wherein the communication device is electrically coupled to the guide element.

9. Visual communication system according to any of claims 3-8, wherein the guide element comprises a first communication member adapted to maintain connectivity with the communication device when positioned at any position along the length of the guide element, independent of the position of the communication device on the guide element.

10. Visual communication system according to claim 9, wherein the first communication member comprises a retractable cable.

11. Visual communication system according to claim 9 or 10, further comprising a converter and a second communication member, wherein the converter is adapted to receive the first communication member.

12. Visual communication system according to claim 11, wherein the second communication member comprises a second cable.

13. Visual communication system according to claim 11 or 12, wherein the converter is adapted to convert a signal carried by the first communication member into a signal carried by the second communication member.

14. Visual communication system according to claim 13, wherein the first communication member carries a serial signal, and wherein the converter is adapted to convert the serial signal into a USB signal.

15. Visual communication system according to any of claims 3-14, wherein the communication device comprises a touch sensitive surface.

16. Visual communication system according to any of claims 3-15, wherein the communication device comprises a laser-tracking surface.

17. Visual communication system according to any of the previous claims, the track system positioned with an existing wall structure.

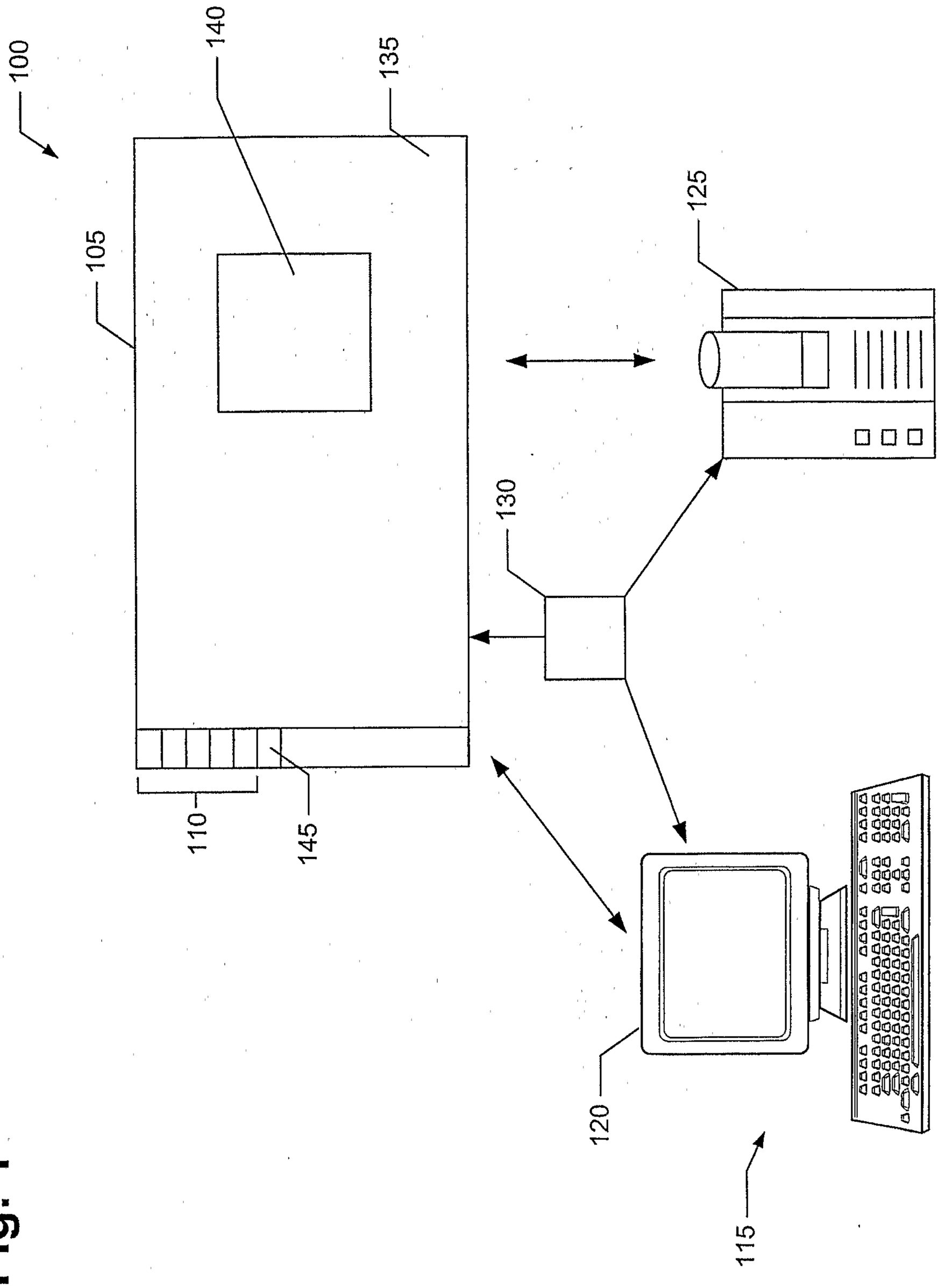


Fig. 1

Fig. 2A

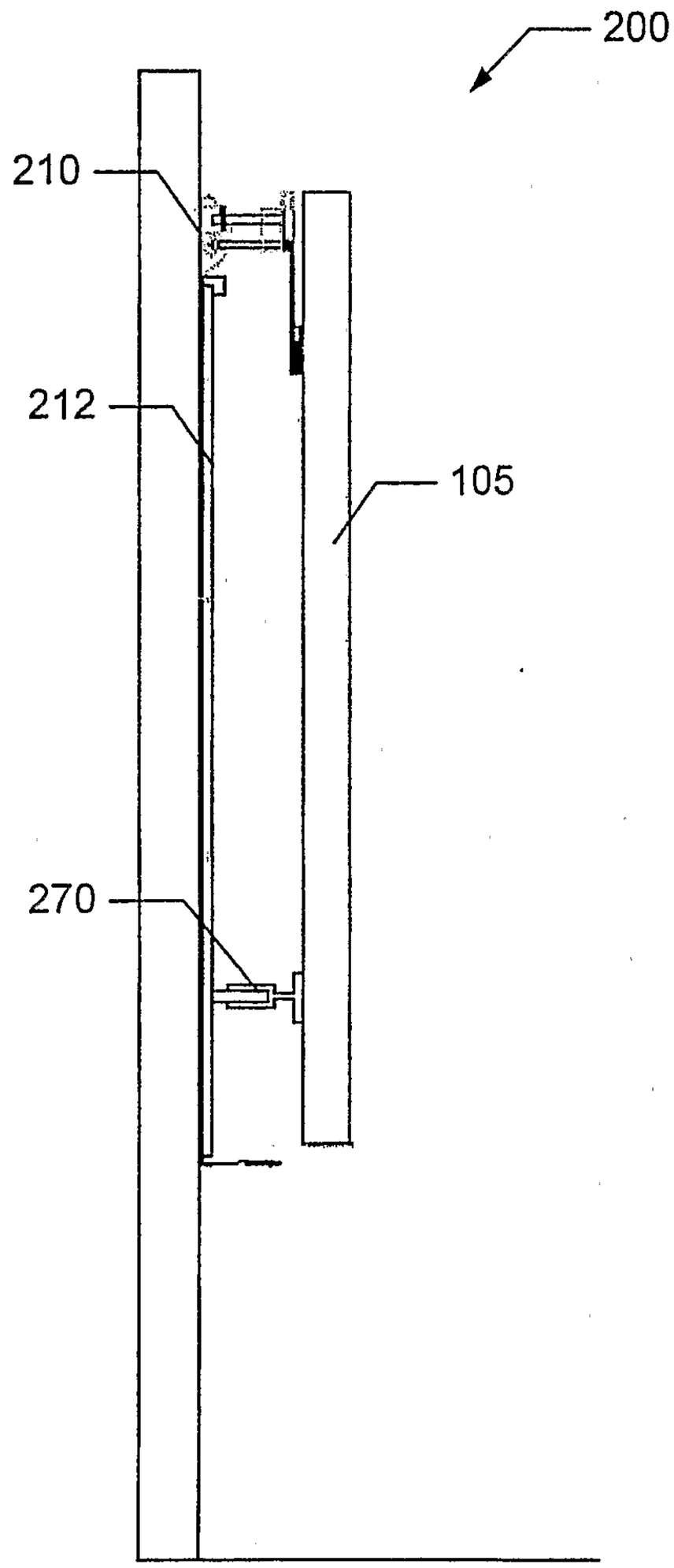


Fig. 2B

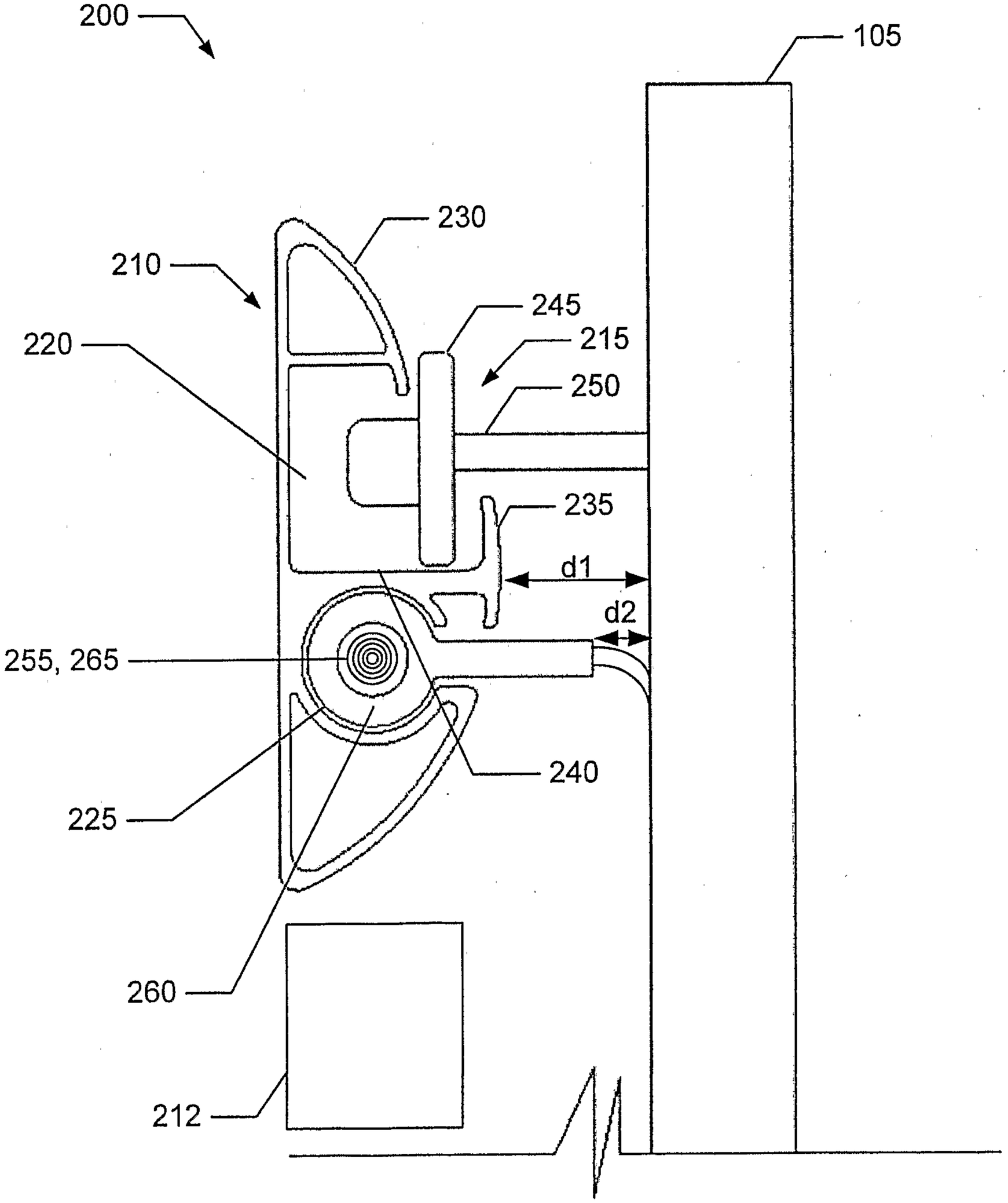
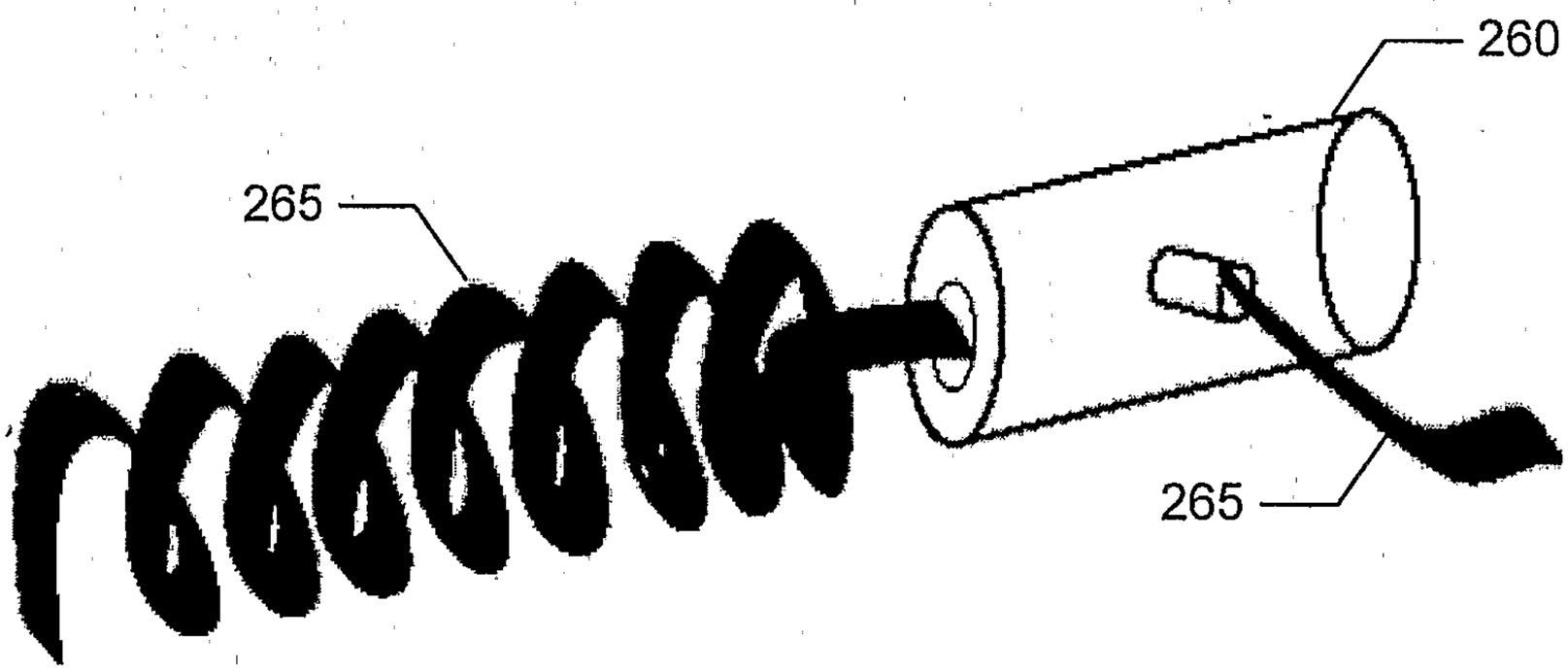


Fig. 2C



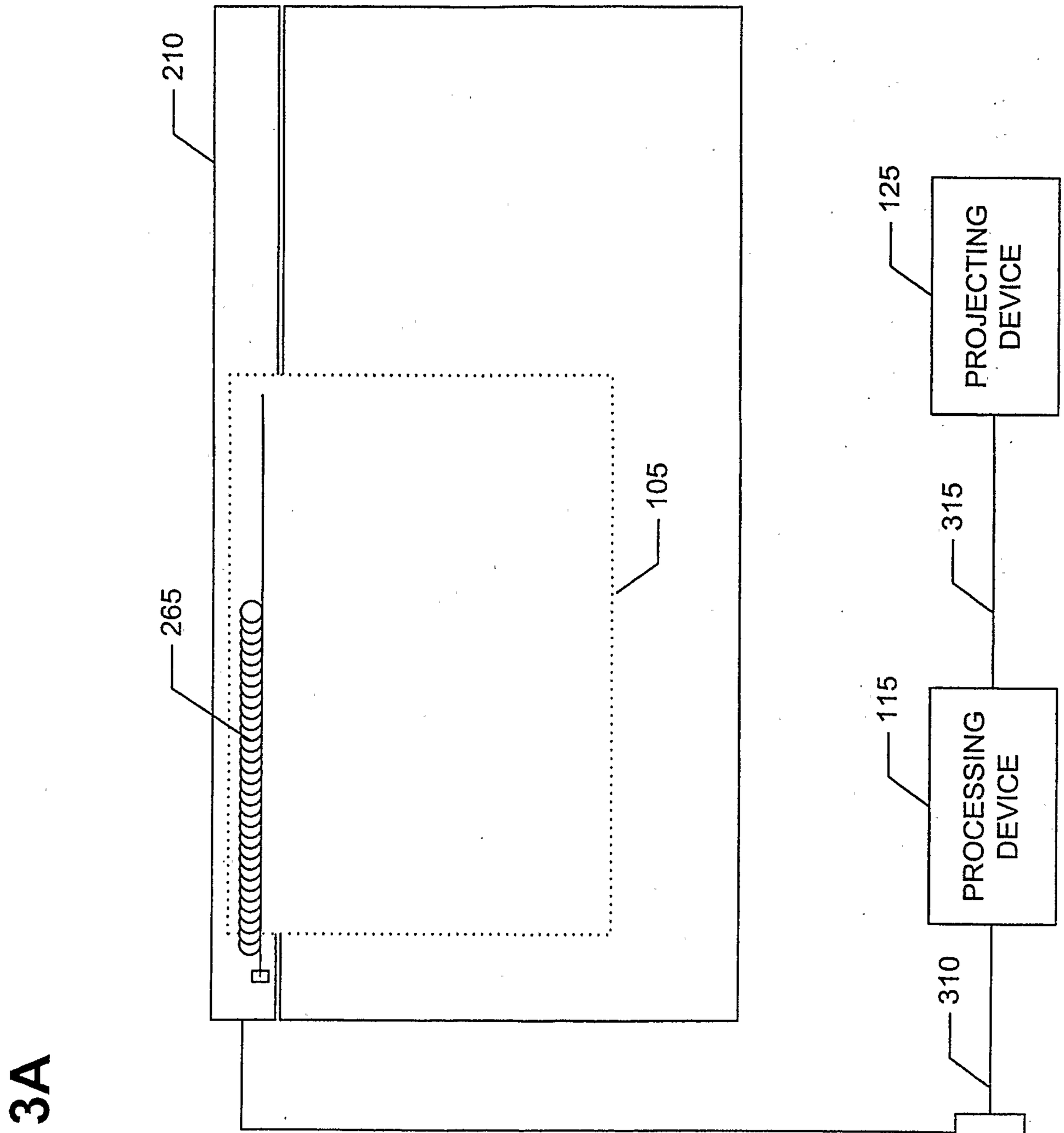

210
105
265
125
PROJECTING DEVICE
315
115
PROCESSING DEVICE
310
305

Fig. 3A

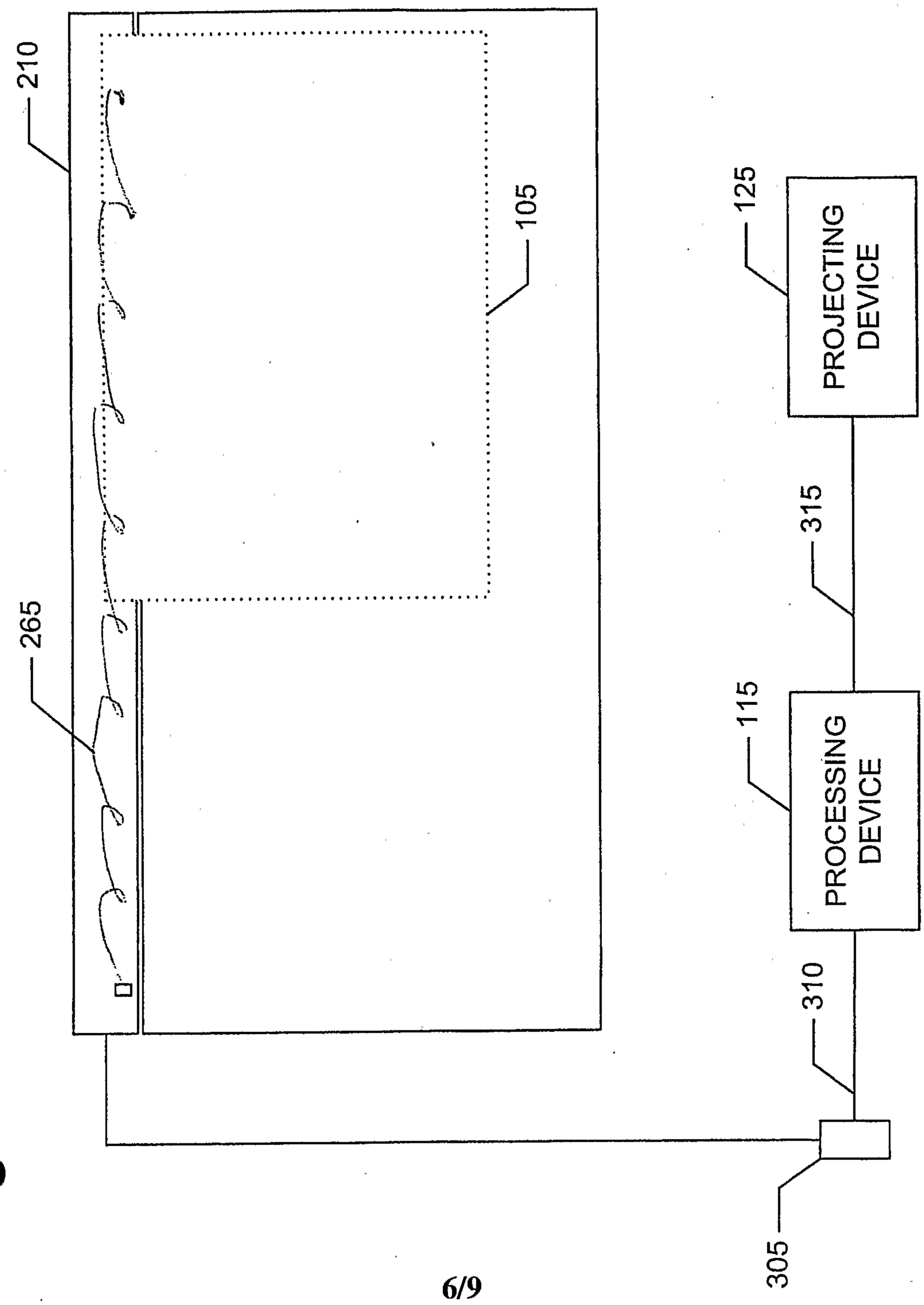

210
105
265
125
PROJECTING DEVICE
315
115
PROCESSING DEVICE
310
305

Fig. 3B

Fig. 3C

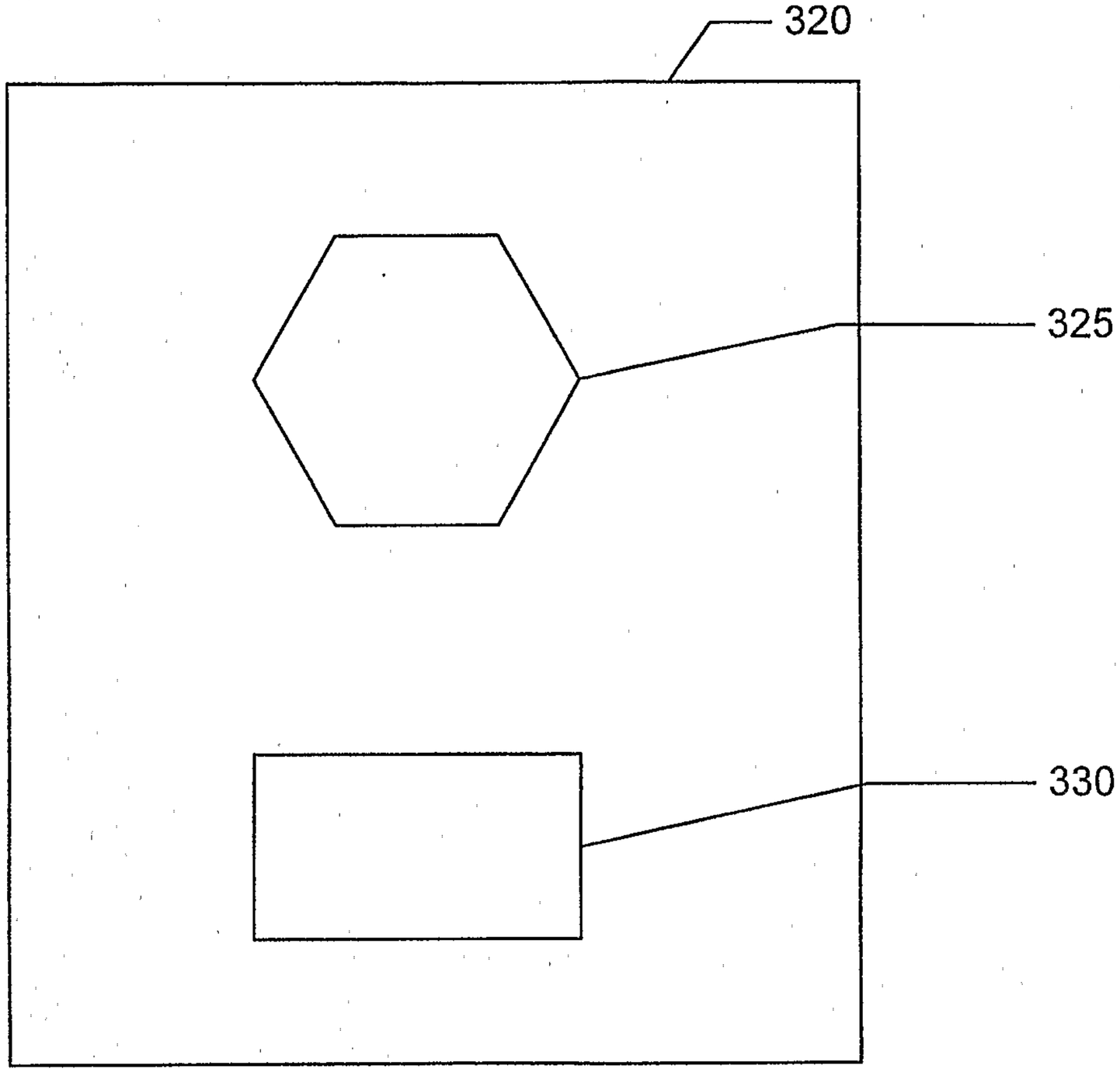
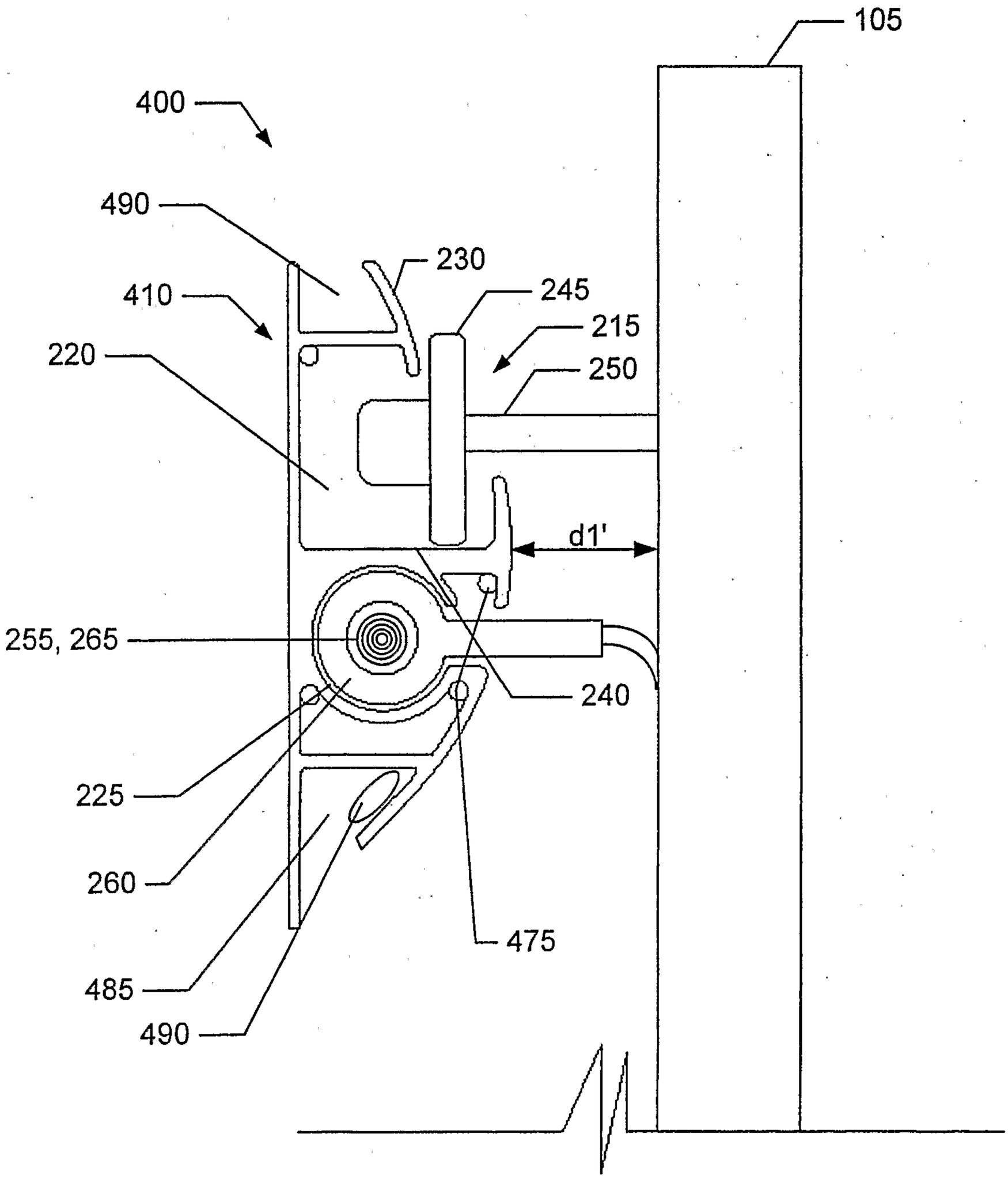


Fig. 4


105
400
490
230
410
245
215
220
250
d1'
255, 265
240
225
260
475
485
490

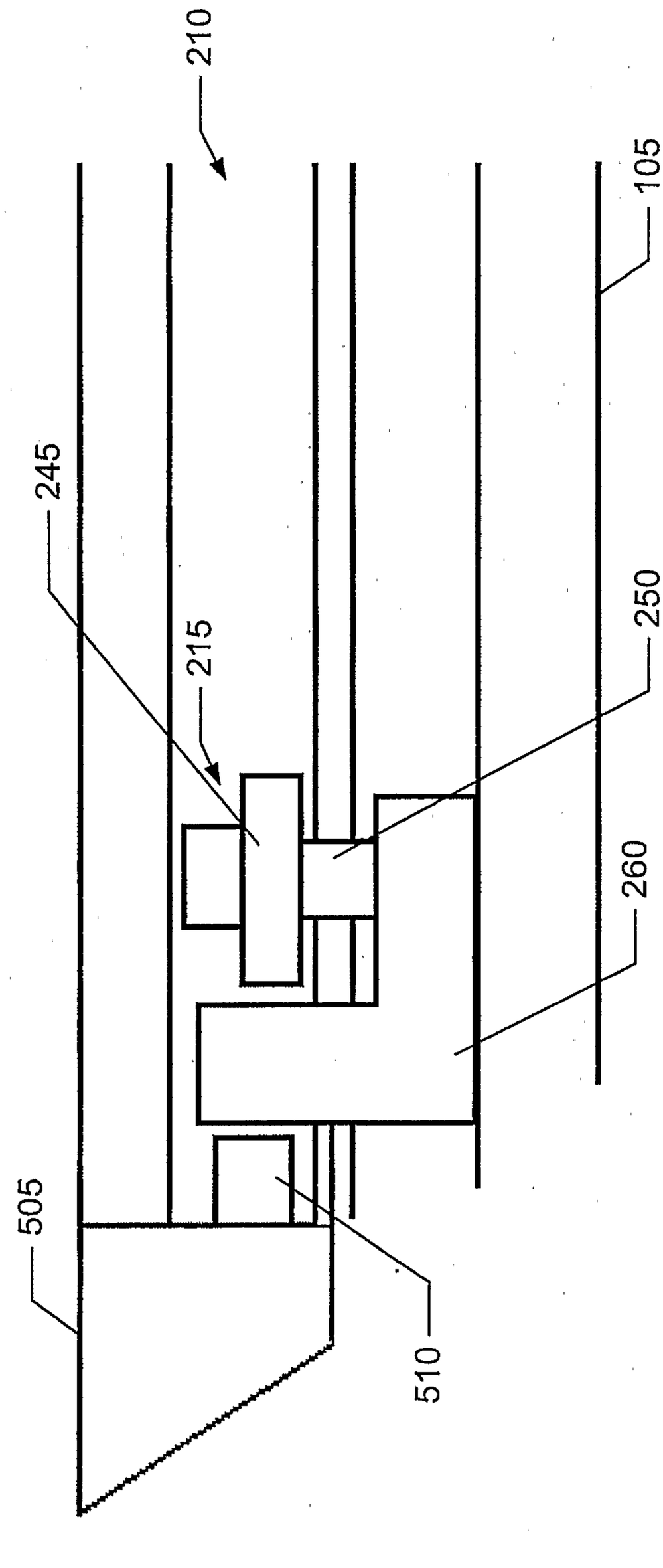
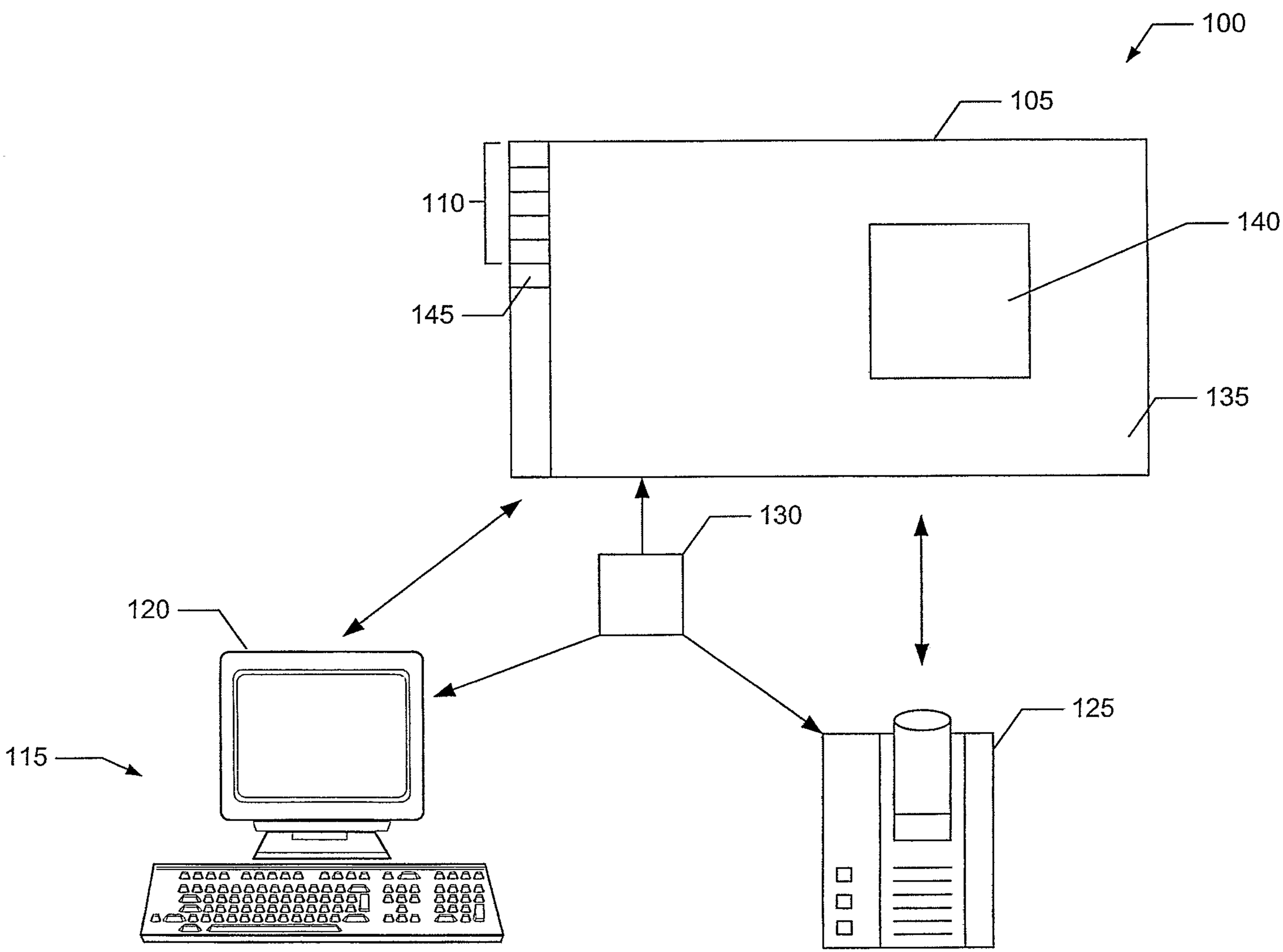


Fig. 5


100
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135
130
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