

APPENDIX C

Lefevre in view of Chandran

U.S. Patent No. 9,977,519

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
Claim 1 (Ind. Claim)		
1[pre] A processing system for an input device, the processing system comprising:	Lefevre discloses an input device with a processing system. Specifically, Lefevre discloses a board 105, or an input device, which “comprises a detection surface 115 coupled to a screen 120 and a magnetized surface 125 (the detection surface 115, the screen 120, and the magnetized surface 125 are here substantially parallel).” Lefevre ¶0057. The board 105 (the input device) also “comprises a hardware module 130 (or central processing system).” <i>Id.</i> “The hardware module 130 typically comprises a calculation module and a control module for position detection and capture, as detailed below. The calculation module is fitted here with a central processing unit (CPU), a graphics processing unit (GPU), memory components (Random Access Memory (RAM), Read Only Memory (ROM), and/or Flash type memory) to store the programs and variables needed for the implementation of the invention as well as an audio processing module in the form, for example, of a chipset.” <i>Id.</i> ¶0059.	Chandran discloses an input device with a processing system. Specifically, Chandran discloses “a capacitive sensing panel 100” (the input device) that “is of a type useful for a touchscreen panel for an electronic device such as a smart phone, GPS device, tablet computer, mobile media player, remote control device, or any other device capable of using a touchscreen panel.” Chandran, at 1:24-1:29. A POSITA would understand that such devices include a processing system. Chandran also discloses that “[i]t is thus possible for the control circuitry 120 and active stylus 130 to engage in a bidirectional communication.” <i>Id.</i> at 2:49-2:50. A POSITA would understand that a processing system is required for such communication.
1[a] a sensor module coupled to sensor circuitry and configured to:	Lefevre discloses a sensor module coupled to sensor circuitry. Specifically, Lefevre discloses a board 105, or an input device, which “comprises a detection surface 115 coupled to a screen 120 and a magnetized surface 125 (the detection surface 115, the screen 120, and the magnetized surface 125 are here substantially parallel).” Lefevre ¶0057. The board 105 (the input device) also “comprises a hardware module 130 (or central processing system).” <i>Id.</i> The hardware module 130 “presents a set of standard connections 135, for example an electrical socket for a	Chandran discloses a sensor module coupled to sensor circuitry. Specifically, Chandran discloses that the control circuitry of the touchpad “causes a periodic signal to be applied to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 152. This signal transmission may, for example, comprise a wake-up or polling message, with the active stylus functioning in a sleep mode waiting for receipt of the message.” Chandran, at 5:15-5:22. A POSITA would

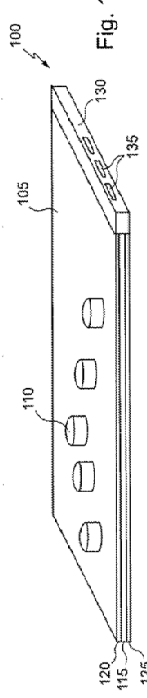
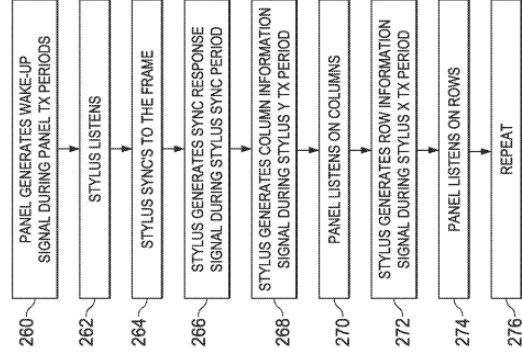
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) mains adapter, USB, Ethernet, VGA (Video Graphics Array) and/or HDMI (High Definition Multimedia) ports, as appropriate, in particular if a screen is combined with the detection zone. It also comprises, preferably, a wireless communication module, for example a WiFi or Bluetooth type wireless communication module making it possible to interact with another computer system and/or to access data via a communication network.” <i>Id.</i> ¶0058. “The hardware module 130 typically comprises a calculation module and a control module for position detection and capture, as detailed below. The calculation module is fitted here with a central processing unit (CPU), a graphics processing unit (GPU), memory components (Random Access Memory (RAM), Read Only Memory (ROM), and/or Flash type memory) to store the programs and variables needed for the implementation of the invention as well as an audio processing module in the form, for example, of a chipset.” <i>Id.</i> ¶0059.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
1 b initiate a current beacon period comprising a plurality of timeslots by broadcasting, to a plurality of active pens comprising a first active pen, a current beacon signal comprising an upstream packet for the first active pen and	Lefevre discloses that “the activation of all the localisation modules is initiated by a central processing system (control module for position detection and capture) with a common activation signal, each localisation module independently determining its activation as a function of the common activation signal.” Lefevre, at ¶0192. Lefevre further explains that “said activation signal is a common activation signal for common control of the activation of a plurality of localisation modules.” <i>Id.</i> ¶0017. Thus, transmitting, by a central processing system (control module for position detection and capture), a common activation signal to all the localisation modules of a plurality of mobile elements 110, corresponds to broadcasting a current beacon signal to a plurality of active pens comprising a first active pen.	understand that this comprises a sensor module coupled to sensor circuitry. Chandran discloses that the control circuitry of the touchpad “causes a wake-up signal to be applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 252.” Chandran, at 6:37-6:44. “The wake-up signal may be modulated to carry information if desired.” <i>Id.</i>

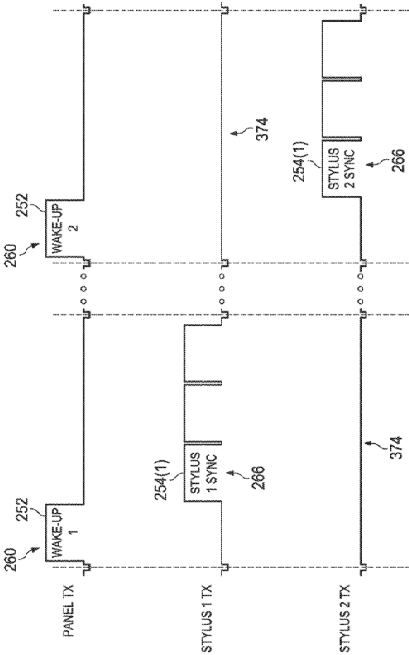
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
specifying a pen identification (ID) associated with the first active pen;	Lefevre discloses that a current beacon signal as “a common activation signal, denoted sync” and an upstream packet included in a current beacon signal as “an activation instruction included in a common activation signal, denoted sync.” <i>Id.</i> ¶0194. Lefevre further discloses the upstream packet contains the index i or the identification code, specifying a corresponding index i or an identification code associated with a mobile element, which a POSITA would understand to be specifying a pen ID associated with the active pen. <i>See id.</i> ¶¶0165-0166. Lefevre discloses that the first timeslot TS0 initiates the previous a periodic pulse of period P1 (corresponding to the prior beacon period) by broadcasting the previous common activation signal (corresponding to the prior beacon). <i>Id.</i> ¶¶0210-0214, 0221-0225. The above process corresponds to initiating a prior beacon period by broadcasting a prior beacon. Lefevre further discloses that “the first timeslot TS0 begins at the moment of emission of an activation “instruction” of the common activation signal. It is specific and reserved for the arrival of new localisation modules”. <i>Id.</i> ¶0212. The new localisation modules correspond to the unpaired localisation modules or the nonactivated localisation modules. Thus, Lefevre discloses that the first active pen is unpaired during a portion of the prior beacon period. Lefevre further discloses that in the prior beacon period, during the timeslot TS0, the unpaired localisation module transmits a signal (corresponding to the ACK of the prior beacon), and if the central processing system receives a signal from the localisation module at the timeslot TS0, the central processing system emits a secondary activation	FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre> “In an embodiment, the wake-up signal applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 152 and step 260 may be modulated to include stylus identification information (i.e., the identification of the stylus with whom the panel wishes to communicate). The stylus identification information may comprise an identification that is unique to a particular stylus or instead is more generic and applicable to a class or group of styluses. Any stylus proximate enough to the panel will receive the wake-up signal in step 262. The receiving stylus 130 functions to compare its stylus identification value to the stylus identification information included in the wake-up signal.”

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		FIG. 4 Additionally, Chandran discloses “a time division multiplexed operation” communication mode for communication to and/or from the active stylus. <i>See id.</i> at 4:51-5:8, Fig. 3: FIG. 3

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		“From sensing the panel transmitted periodic signal during the periods 152, the stylus 130 is activated and functions to synchronize itself in step 164 to the communications frame 150 and thus know the timing location of the stylus transmit periods 154.” <i>Id.</i> at 5:26-30. “From sensing the panel transmitted wake-up signal during the periods 252, the stylus 130 is able to synchronize itself in step 264 to the communications frame 250 and thus know the timing location of the stylus transmit periods 254(1)-254(3).” <i>Id.</i> at 6:47-52.
1[c] receive, during a first timeslot, a first downstream packet from a first active pen transceiver of the first active pen; and	Lefevre discloses that the mobile elements (i.e., the active pens) have a localisation module with a “means for emitting a signal making it possible to calculate the position of said localization module,” as well as a “means for receiving an activation signal” from a computer. Lefevre, at ¶¶0010, 0027-0031. Because the localization module of the mobile element can transmit and receive signals, a POSITA would understand that it has a transceiver. Lefevre discloses that, during its designated timeslot, the active pen can transmit information such as button status. <i>See, e.g.,</i> Lefevre at ¶¶0261-0262 (“In addition, specific characteristics (colour, eraser or line thickness function for a mobile element representing a pencil) can be associated with the different mobile elements. They can be transmitted by the localisation modules (directly or as a function of associated time delay values), as described above. The selection of a function or colour can be displayed on the object comprising the localisation module in question by dedicated Light-Emitting Diode (LED) display, for example. For the same mobile element, it is also possible to change its characteristics by modifying one of these parameters upon user action (a ring, a thumbwheel, or a switch on the pen for example). On the basis of these mechanical interventions, a	Chandran discloses that it is “possible for the control circuitry 120 and the active stylus 130 to engage in a bidirectional communication.” Chandran, at 2:49-60. The control circuitry 120 is a component of the capacitive sensing panel (i.e., a touchpad). <i>See id.</i> at Fig. 1; <i>id.</i> at 2:23-2:24. Because the control circuitry of the touchpad and the active stylus engage in bidirectional communication, a POSITA would understand that the active stylus has a transceiver. Chandran also discloses “an embodiment of an operating protocol for the communication mode.” <i>Id.</i> at 4:53-5:8. The operating protocol disclosed “comprises a time division multiplexed operation in accordance with a repeating communications frame 150, wherein each frame 150 includes at least one panel transmit period 152 and at least one stylus transmit period 154.” <i>Id.</i> “During the panel transmit period 152, the control circuitry 120 drives a signal possibly modulated by information (data) on the interconnected nodes 113 of the columns 115 and/or rows 117 of the capacitive sensing panel. The active stylus 130 is capacitively coupled to the panel and operable to sense the panel transmit signal and recover any information contained in that signal. Conversely, during the stylus transmit period 154, the stylus 130 generates a signal possibly modulated by information

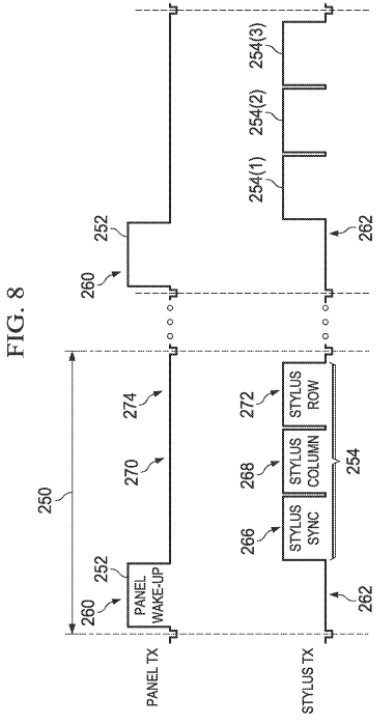
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) microcontroller present in the localisation module can modify the associated time delay value or transmit data, in particular in the form of a bit stream, indicating that a new function has been selected.”).	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”) (data) and capacitively coupled to the rows and columns of the panel. The control circuitry 120 of the panel functions to sense the capacitive change on nodes 113 and recover any information sent by the stylus 130. It will be understood that the illustration of two panel transmit periods 152 interleaved with two stylus transmit periods 154 in one frame 150 is exemplary only of a basic communications protocol.” <i>Id.</i> This exemplifies the bidirectional communication.
		FIG. 3 Chandran discloses that, during its designated timeslot, the active pen can transmit information such as button status. For example, in Fig. 7, at “step 268, the stylus 130 generates a column information signal for communication to the panel (through its capacitive coupling) during the stylus Y transmit period 254(2). The column information signal may be modulated to include button and pressure information.” Chandran, at 6:34-7:13. Additionally, “at step 272, the stylus 130 generates a row information signal for communication to the panel (through its capacitive coupling) during the stylus X transmit period 254(3). The row information signal may be modulated to include button and pressure information.” <i>Id.</i>

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1[d] receive, during a second timeslot, a second downstream packet from a second active pen transceiver; and	Lefevre discloses the concurrent use of multiple mobile elements, or active pens. <i>See</i> Lefevre, at ¶0056 (“Although only five mobile elements are shown here, it is possible to use several tens or even several hundreds.”); <i>see also</i> Fig. 1:  Fig. 1 It would be obvious to a POSITA that the embodiments disclosed in Lefevre described in 1[c] would apply to a second active pen.	FIG. 7  Chandran discloses the concurrent use of multiple styluses, or active pens. <i>See, e.g.</i>, Chandran at 7:44-7:45 (“The foregoing process facilitates the association of multiple styluses to a single panel.”); <i>id.</i> at 7:57-7:58 (“To facilitate a multiple stylus association, the control circuitry 120 must be able to identify each associated stylus.”); <i>see also</i> Fig. 10:

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1[e] a determination module configured to:	Lefevre discloses “a hardware module 130 (or central processing system) to detect the position and, if necessary, the orientation of the mobile elements 110 as well as to implement one or more applications with which the user interacts. The hardware module 130 is in particular responsible for managing the detections of the positions and/or orientations of the mobile elements, i.e. identifying the localisation modules one after another, activating them so that they emit, each in turn, an electromagnetic field, and evaluating their positions.” Lefevre ¶0057. The hardware module “comprises, preferably, a wireless communication module, for example a WiFi or Bluetooth type wireless communication module making it possible to interact with another computer system and/or to access data via a communication network.” <i>Id.</i> ¶0058. “The hardware module 130 typically comprises a calculation module and a control	 FIG. 10 It would be obvious to a POSITA that the embodiments disclosed in Chandran described in 1[c] would apply to a second active pen.
1[e] a determination module configured to:	Lefevre discloses “a hardware module 130 (or central processing system) to detect the position and, if necessary, the orientation of the mobile elements 110 as well as to implement one or more applications with which the user interacts. The hardware module 130 is in particular responsible for managing the detections of the positions and/or orientations of the mobile elements, i.e. identifying the localisation modules one after another, activating them so that they emit, each in turn, an electromagnetic field, and evaluating their positions.” Lefevre ¶0057. The hardware module “comprises, preferably, a wireless communication module, for example a WiFi or Bluetooth type wireless communication module making it possible to interact with another computer system and/or to access data via a communication network.” <i>Id.</i> ¶0058. “The hardware module 130 typically comprises a calculation module and a control	Chandran discloses that the control circuitry of the touchpad “causes a wake-up signal to be applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes,” and that it “may be modulated to carry information if desired.” Chandran, at 6:37-6:44. A POSITA would understand that the processing system of the touchpad must have a determination module as disclosed in the ‘519 Patent.

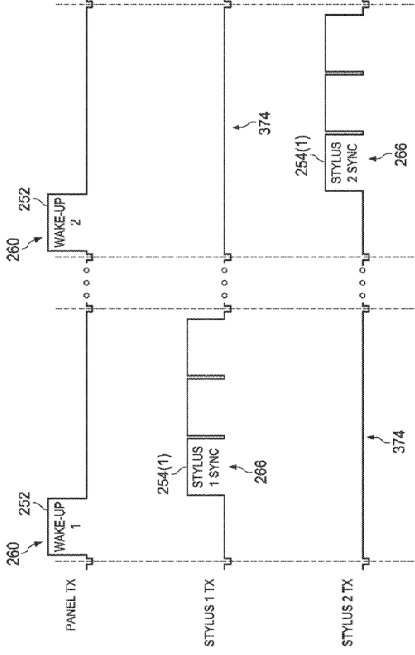
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	module for position detection and capture, as detailed below. The calculation module is fitted here with a central processing unit (CPU), a graphics processing unit (GPU), memory components (Random Access Memory (RAM), Read Only Memory (ROM), and/or Flash type memory) to store the programs and variables needed for the implementation of the invention as well as an audio processing module in the form, for example, of a chipset.” <i>Id.</i> ¶0059. A POSITA would understand that the hardware module disclosed in Lefevre contains a determination module.	
1[f] generate the upstream packet for the first active pen specifying the pen ID; and	Lefevre discloses that “the activation of all the localisation modules is initiated by a central processing system (control module for position detection and capture) with a common activation signal, each localisation module independently determining its activation as a function of the common activation signal.” Lefevre, at ¶0192. Lefevre further explains that “said activation signal is a common activation signal for common control of the activation of a plurality of localisation modules.” <i>Id.</i> ¶0017. Thus, transmitting, by a central processing system (control module for position detection and capture), a common activation signal to all the localisation modules of a plurality of mobile elements 110, corresponds to broadcasting a current beacon signal to a plurality of active pens comprising a first active pen. Lefevre discloses “a common activation signal, denoted sync” and an upstream packet as “an activation instruction included in a common activation signal, denoted sync.” <i>Id.</i> ¶0194. Lefevre further discloses the upstream packet contains the index i or the identification code, specifying a corresponding index i or an identification code associated with a mobile element, which a POSITA would understand	Chandran discloses that the control circuitry of the touchpad “causes a wake-up signal to be applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 252.” Chandran, at 6:37-6:44. “The wake-up signal may be modulated to carry information if desired.” <i>Id.</i>

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) to be specifying a pen ID associated with the active pen. <i>See</i> <i>id.</i> ¶¶0165-0166.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre> “In an embodiment, the wake-up signal applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 152 and step 260 may be modulated to include stylus identification information (i.e., the identification of the stylus with whom the panel wishes to communicate). The stylus identification information may comprise an identification that is unique to a particular stylus or instead is more generic and applicable to a class or group of styluses. Any stylus proximate enough to the panel will receive the wake-up signal in step 262. The receiving stylus 130 functions to compare its stylus identification value to the stylus identification information included in the wake-up signal.”

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1[g] determine an attribute of the first active pen comprising the first active pen transceiver from at least the first downstream packet.	Lefevre discloses that, during its designated timeslot, the active pen can transmit information such as button status. <i>See, e.g.,</i> Lefevre at ¶¶0261-0262 (“In addition, specific characteristics (colour, eraser or line thickness function for a mobile element representing a pencil) can be associated with the different mobile elements. They can be transmitted by the localisation modules (directly or as a function of associated time delay values), as described above. The selection of a function or colour can be displayed on the object comprising the localisation module in question by dedicated Light-Emitting Diode (LED) display, for example. For the same mobile element, it is also possible to change its characteristics by modifying one of these parameters upon user action (a ring, a thumbwheel, or a switch on the pen for example). On the basis of these mechanical interventions, a microcontroller present in the localisation module can modify the associated time delay value or transmit data, in	<i>Id.</i> at 7:23-7:43. Thus, a POSITA would understand the signal (or beacon) from the panel (or input device) contains a pen ID.  FIG. 8
		Chandran discloses that, during its designated timeslot, the active pen can transmit information such as button status. For example, in Fig. 7, at “step 268, the stylus 130 generates a column information signal for communication to the panel (through its capacitive coupling) during the stylus Y transmit period 254(2). The column information signal may be modulated to include button and pressure information.” Chandran, at 6:34-7:13. Additionally, “at step 272, the stylus 130 generates a row information signal for communication to the panel (through its capacitive coupling) during the stylus X transmit period 254(3). The row information signal may be modulated to include button and pressure information.” <i>Id.</i>

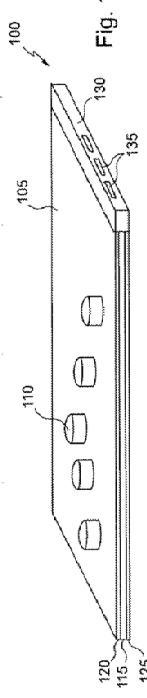
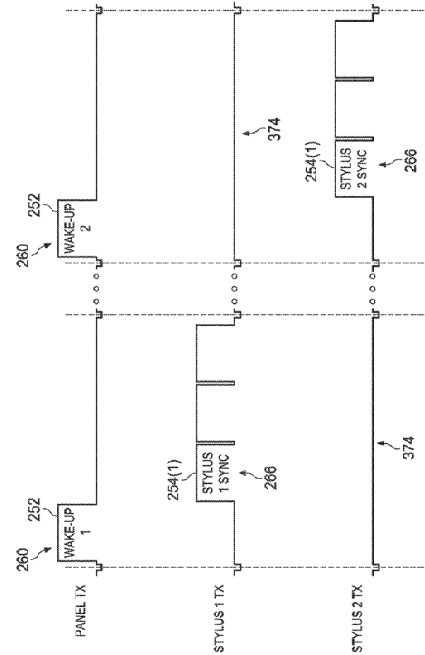
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) particular in the form of a bit stream, indicating that a new function has been selected.”).	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre>
Claim 2		
2[pre] The processing system of claim 1,	<i>See supra</i> 1[pre] – 1[g].	<i>See supra</i> 1[pre] – 1[g].
2[a] wherein the first active pen further comprises the second active pen transceiver,	Lefevre discloses that the mobile elements 110 (i.e., the active pens) have a localisation module with a “means for emitting a signal making it possible to calculate the position of said localization module,” as well as a “means for receiving an activation signal” from a computer. Lefevre, at ¶¶0010, 0027-0031. Because the localization module of the mobile element can transmit and receive signals, a POSITA would understand that it has a transceiver. Lefevre discloses the concurrent use of multiple mobile elements. <i>See</i> Lefevre, at ¶0056 (“Although only five mobile elements are shown here, it is possible to use several tens or even several hundreds.”); <i>see also</i> Fig. 1:	Chandran discloses that it is “possible for the control circuitry 120 and the active stylus 130 to engage in a bidirectional communication.” Chandran, at 2:49-60. The control circuitry 120 is a component of the capacitive sensing panel (i.e., a touchpad). <i>See id.</i> at Fig. 1; <i>id.</i> at 2:23-2:24. Because the control circuitry of the touchpad and the active stylus engage in bidirectional communication, a POSITA would understand that the active stylus has a transceiver. Chandran also discloses “an embodiment of an operating protocol for the communication mode.” <i>Id.</i> at 4:53-5:8. The operating protocol disclosed “comprises a time division multiplexed operation in accordance with a repeating

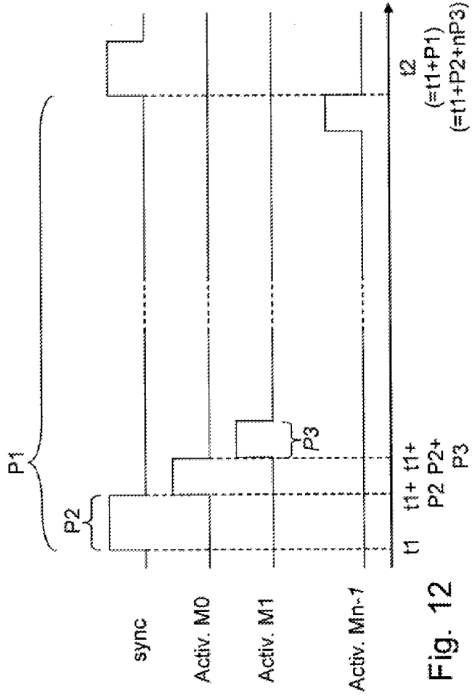
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	Fig. 1 Thus, it would be obvious to a POSITA that each mobile element has a transceiver.	communications frame 150, wherein each frame 150 includes at least one panel transmit period 152 and at least one stylus transmit period 154.” <i>Id.</i> “During the panel transmit period 152, the control circuitry 120 drives a signal possibly modulated by information (data) on the interconnected nodes 113 of the columns 115 and/or rows 117 of the capacitive sensing panel. The active stylus 130 is capacitively coupled to the panel and operable to sense the panel transmit signal and recover any information contained in that signal. Conversely, during the stylus transmit period 154, the stylus 130 generates a signal possibly modulated by information (data) and capacitively coupled to the rows and columns of the panel. The control circuitry 120 of the panel functions to sense the capacitive change on nodes 113 and recover any information sent by the stylus 130. It will be understood that the illustration of two panel transmit periods 152 interleaved with two stylus transmit periods 154 in one frame 150 is exemplary only of a basic communications protocol.” <i>Id.</i> This exemplifies the bidirectional communication. FIG. 3 Chandran discloses the concurrent use of multiple styluses, or active pens. <i>See, e.g., Chandran at 7:44-7:45</i> (“The foregoing process facilitates the association of multiple styluses to a single panel.”); <i>id.</i> at 7:57-7:58 (“To facilitate a multiple

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		stylus association, the control circuitry 120 must be able to identify each associated stylus.”); <i>see also</i> Fig. 10:  FIG. 10 Thus, it would be obvious to a POSITA that each stylus has a transceiver.
2[b] and wherein the attribute of the first active pen is further determined from the second downstream packet.	Lefevre discloses a “method [that] further comprises a step to transmit at least one item of data from said at least one localisation module to said computer system. Said at least one item of data can in particular be representative of an identifier of said at least one localisation module. In this case, it allow [sic], the computer system to associate a position with a localisation module. It can also be representative of a state of the localisation module or a function associated therewith.” Lefevre ¶0023. A POSITA would understand that, from this information transmitted from the second downstream packet from the second active pen, the processing system would determine an attribute of the first active pen, in that it would determine	Chandran discloses a method for the synchronization and use of multiple styluses: “To facilitate a multiple stylus association, the control circuitry 120 must be able to identify each associated stylus. To accomplish this goal, an initialization or configuration (as with a pairing) operation as shown in FIG. 9 is executed where the stylus identification information in the wake-up signal sent in step 360 is shared in common by a class or group of styluses. Any stylus proximate enough to the panel will receive the wake-up signal in step 362. The receiving stylus 130 functions to compare its stylus identification value to the common identification information included in the wake-up signal (step 364). If there is a match or correlation regarding identification, the stylus 130 will synchronize itself in step

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) that the first active pen is different than the second active pen.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		366 to the communications frame 250 and generate the responsive sync signal for communication back to the panel confirming synchronization to the panel in step 368. The responsive signal is modulated with information providing the unique identification of the responding stylus. The panel listens in step 370 and the control circuitry 120 is provided with the unique identification from the responding styluses. The unique identification of each responding stylus is stored (in step 372) so as to allow the control circuitry 120 to maintain a record of associated styluses and their identification values.” Chandran at 7:57-8:12. <pre> graph TD 360[PANEL GENERATES WAKE-UP SIGNAL WITH COMMON ID] --> 362[STYLUSES LISTEN] 362 --> 364{ID MATCH ?} 364 -- NO --> 374[IGNORE] 364 -- YES --> 366[STYLUSES SYNC TO FRAME] 366 --> 368[STYLUSES GENERATE SYNC RESPONSE SIGNAL WITH UNIQUE ID] 368 --> 370[PANEL LISTENS] 370 --> 372[STORE STYLUSES ID'S] </pre> FIG. 9 A POSITA would understand that, from this information transmitted from the second downstream packet from the second active pen, the processing system would determine an

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		attribute of the first active pen, in that it would determine that the first active pen is different than the second active pen.
Claim 3		
3[pre] The processing system of claim 1,	<i>See supra</i> 1[pre] – 1[g].	<i>See supra</i> 1[pre] – 1[g].
3[a] wherein the attribute is at least one selected from a group consisting of pen tilt, color, and erasure mode.	Lefevre discloses that the attributes communicated by the mobile elements can include color and erasure data. Lefevre ¶0261 (“In addition, specific characteristics (colour, eraser or line thickness function for a mobile element representing a pencil) can be associated with the different mobile elements. They can be transmitted by the localisation modules (directly or as a function of associated time delay values), as described above.”). A POSITA would expect that the characteristics could include pen tilt data.	Chandran discloses that different styluses can communicate their different colors to the processing system. <i>See, e.g.</i> , Chandran at 7:44-7:52 (“The foregoing process facilitates the association of multiple styluses to a single panel. Such a feature is beneficial when the panel is provided with a system supporting applications and uses which would benefit from the use of different styluses. One example of this would be an art application where multiple styluses are provided, each stylus presenting a different artistic function such as, for example, different colors, different line widths, different shadings, different brush techniques, different media and the like.”). A POSITA would expect that the characteristics communicated could also include pen tilt and erasure mode data.
Claim 4		
4[pre] The processing system of claim 1, wherein the determination module is further configured to:	<i>See supra</i> 1[pre] – 1[g].	<i>See supra</i> 1[pre] – 1[g].
4[a] determine an attribute of a second active pen	Lefevre discloses that, during its designated timeslot, the active pen can transmit information such as button status. <i>See, e.g.</i> , Lefevre at ¶0261-0262 (“In addition, specific	Chandran discloses the concurrent use of multiple styluses, or active pens. <i>See, e.g.</i> , Chandran at 7:44-7:45 (“The foregoing process facilitates the association of multiple styluses to a

Claim Elements U.S. Patent No. 9,977,519	comprising the second active pen transceiver from the second downstream packet. characteristics (colour, eraser or line thickness function for a mobile element representing a pencil) can be associated with the different mobile elements. They can be transmitted by the localisation modules (directly or as a function of associated time delay values), as described above. The selection of a function or colour can be displayed on the object comprising the localisation module in question by dedicated Light-Emitting Diode (LED) display, for example. For the same mobile element, it is also possible to change its characteristics by modifying one of these parameters upon user action (a ring, a thumbwheel, or a switch on the pen for example). On the basis of these mechanical interventions, a microcontroller present in the localisation module can modify the associated time delay value or transmit data, in particular in the form of a bit stream, indicating that a new function has been selected.”). Lefevre discloses the concurrent use of multiple mobile elements. <i>See</i> Lefevre, at ¶0056 (“Although only five mobile elements are shown here, it is possible to use several tens or even several hundreds.”); <i>see also</i> Fig. 1:  Fig. 1	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
Claim 6 6[pre] The processing system of claim 4, wherein the	<i>See supra</i> 1[pre] – 1[g]; 4[pre] – 4[a].	single panel.”); <i>id.</i> at 7:57-7:58 (“To facilitate a multiple stylus association, the control circuitry 120 must be able to identify each associated stylus.”); <i>see also</i> Fig. 10:  FIG. 10 It would be obvious to a POSITA that the embodiments disclosed in Chandran described in 1[g] would apply to a second active pen.	

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
determination module is further configured to:		
6[a] detect a collision between the first active pen and the second active pen; and	Lefevre discloses that “a common activation signal, denoted sync, comprises here periodic pulses, of period P1 and duration P2. The purpose of each pulse of the sync signal, representing an activation “instruction”, is the sequential activation of the localisation modules (all or those previously selected)”. Lefevre, at ¶0194. As shown in Figure 12, each periodic pulse of period P1 includes a common activation signal (duration P2) and a plurality of timeslots with a period of P3, corresponding here to the duration of activation of each localisation module (P3 is here defined as $P1=P2+n \times P3$, where n represents the number of localisation modules to be activated during a period P1). <i>Id.</i> ¶0196, Fig. 12.  Fig. 12	Chandran discloses a scenario where two or more styluses collide with each other. The control circuitry generates wake up signals again, which a POSITA would consider as detecting, generating, and sending a collision packet. <i>See</i> Chandran, at 8:29-48 (“The transmission of the wake-up signal in step 360 of 3° FIG. 9 is essentially a point to multi-point broadcast communication. It is possible that multiple styluses will receive the wake-up signal, satisfy the matching test of step 364, and want to generate the sync response signal in step 368. This raises a concern that multiple styluses will simultaneously communicate during a single stylus sync period 266. If such simultaneous communications occur from multiple styluses, there is a possibility of the signals stepping on each other and the control circuitry 120 may not receive stylus sync confirmations and stylus identification information. To avoid this, when the control circuitry 120 detects a first stylus, for example through analyzing the location of the stylus relative to the panel, the control circuitry will lock onto the stylus by scanning only the [columns] and rows of that location. When two styluses are close to each other to a degree prohibiting separation by the control circuitry, the control circuitry will ignore the styluses and generate wake up signals again as in step 360 of FIG. 9.”).

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	Lefevre discloses that “[a]t each cycle and for each free timeslot,” it could occur that “the timeslot has been selected by several localisation modules, which emit during the period of the timeslot: the central processing system detects a collision of signals and continues to indicate that the timeslot is free by emitting a secondary activation signal at the end of the timeslot.” <i>Id.</i> ¶0215.	
6 b generate a collision packet for the first active pen and the second active pen,	Lefevre discloses that “[c]ases of collisions are resolved for example by algorithms such as those mentioned in the section entitled ‘Collision backoff and retransmission’ in the IEEE 802.3 Ethernet standard.” <i>Id.</i> ¶0219.	See Chandran, at 8:29-48 (“The transmission of the wake-up signal in step 360 of 3° FIG. 9 is essentially a point to multi-point broadcast communication. It is possible that multiple styluses will receive the wake-up signal, satisfy the matching test of step 364, and want to generate the sync response signal in step 368. This raises a concern that multiple styluses will simultaneously communicate during a single stylus sync period 266. If such simultaneous communications occur from multiple styluses, there is a possibility of the signals stepping on each other and the control circuitry 120 may not receive stylus sync confirmations and stylus identification information. To avoid this, when the control circuitry 120 detects a first stylus, for example through analyzing the location of the stylus relative to the panel, the control circuitry will lock onto the stylus by scanning only the [columns] and rows of that location. When two styluses are close to each other to a degree prohibiting separation by the control circuitry, the control circuitry will ignore the styluses and generate wake up signals again as in step 360 of FIG. 9.”).

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	A POSITA would understand this standard utilizes “collision packets.” <i>See, e.g.</i>, Ex. 1016, IEEE Std 802.3, 2000 Edition, at 4 (“The interface between the MAC sublayer and the Physical Layer includes signals for framing (carrier sense, receive data valid, transmit initiation) and contention resolution (collision detect), facilities for passing a pair of serial bit streams (transmit, receive) between the two layers, and a wait function for timing.”); <i>id.</i> at 47 (“In the event of a collision, the transmitting station’s Physical Layer initially notices the interference on the medium and then turns on the collision detect signal. In half duplex mode, this is noticed in turn by the Transmit Media Access Management component of the MAC sublayer, and collision handling begins. First, Transmit Media Access Management enforces the collision by transmitting a bit sequence called jam.”).	
6[c] wherein the sensor module is further configured to send the collision packet, and	Lefevre discloses that “[c]ases of collisions are resolved for example by algorithms such as those mentioned in the section entitled ‘Collision backoff and retransmission’ in the IEEE 802.3 Ethernet standard.” <i>Id.</i> ¶0219.	<i>See</i> Chandran, at 8:29-48 (“The transmission of the wake-up signal in step 360 of 3° FIG. 9 is essentially a point to multi-point broadcast communication. It is possible that multiple styluses will receive the wake-up signal, satisfy the matching test of step 364, and want to generate the sync response signal in step 368. This raises a concern that multiple styluses will simultaneously communicate during a single stylus sync period 266. If such simultaneous communications occur from multiple styluses, there is a possibility of the signals stepping

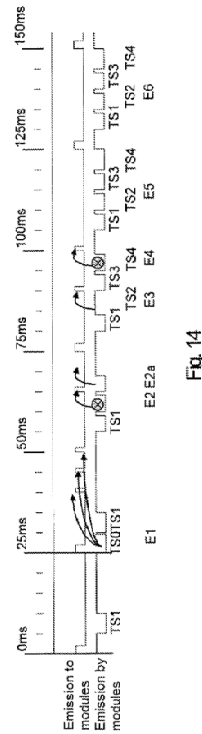


Fig. 14

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	A POSITA would understand this standard utilizes “collision packets.” <i>See, e.g., Ex. 1016, IEEE Std 802.3, 2000 Edition</i>, at 4 (“The interface between the MAC sublayer and the Physical Layer includes signals for framing (carrier sense, receive data valid, transmit initiation) and contention resolution (collision detect), facilities for passing a pair of serial bit streams (transmit, receive) between the two layers, and a wait function for timing.”); <i>id.</i> at 47 (“In the event of a collision, the transmitting station’s Physical Layer initially notices the interference on the medium and then turns on the collision detect signal. In half duplex mode, this is noticed in turn by the Transmit Media Access Management component of the MAC sublayer, and collision handling begins. First, Transmit Media Access Management enforces the collision by transmitting a bit sequence called jam.”).	on each other and the control circuitry 120 may not receive stylus sync confirmations and stylus identification information. To avoid this, when the control circuitry 120 detects a first stylus, for example through analyzing the location of the stylus relative to the panel, the control circuitry will lock onto the stylus by scanning only the [columns] and rows of that location. When two styluses are close to each other to a degree prohibiting separation by the control circuitry, the control circuitry will ignore the styluses and generate wake up signals again as in step 360 of FIG. 9.”).
6[d] wherein each of the first active pen and the second active pen wait a random time interval before reattempting to pair in response to	A POSITA would understand, based on their knowledge of the use of “collision packets” and relevant standards, that, once a collision packet is used, an input device would terminate the transmission and schedule another transmission attempt after a randomly selected time interval. <i>See also</i> Lefevre ¶¶0224-0232:	As discussed above, Chandran discloses that, “When two styluses are close to each other to a degree prohibiting separation by the control circuitry, the control circuitry will ignore the styluses and generate wake up signals again as in step 360 of FIG. 9.” Chandran, at 8:44-48. A POSITA would understand that the wake up signal would be re-sent at a random time interval.

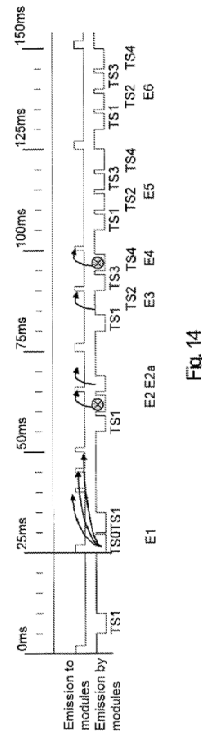


Fig. 14

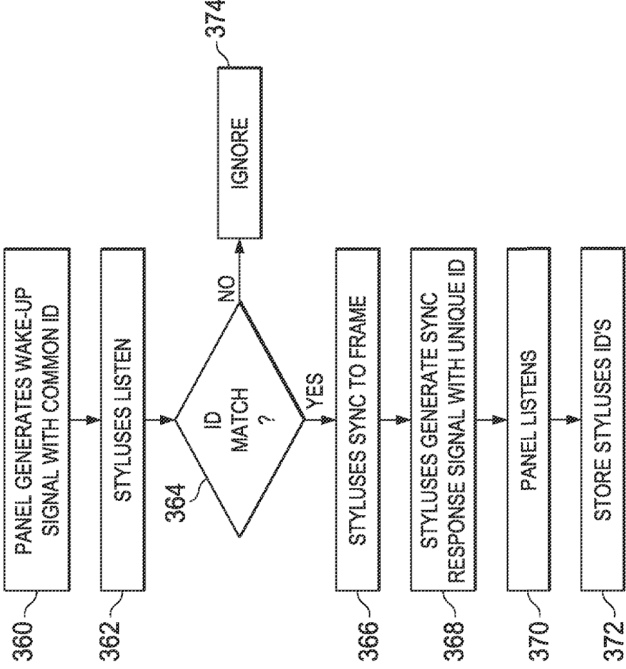
Claim Elements U.S. Patent No. 9,977,519 the collision packet.	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	Steps E1 to E6 of the timing chart show the allocation of timeslots to localisation modules which appear on the detection surface in question: step E1: new localisation modules (with no allocated timeslot) emit by default on timeslot TS0. In response, the central processing system emits secondary activation signals at the end of the free timeslots (here timeslots TS2, TS3 and TS4). The new localisation modules perform random selections to assign timeslots on the basis of the free timeslots. Two of them select timeslot TS2, a third selects timeslot TS3; step E2: there is a conflict on timeslot TS2. The central processing system signals this by maintaining emission of the secondary activation signal at the end of the timeslot, indicating to the localisation modules awaiting assignment that timeslot TS2 is still free. The localisation modules perform a new random selection; step E2 a: there is no conflict on timeslot TS3, the assignment request is accepted. The central processing system signals this by interrupting the emission of the secondary activation signal at the end of timeslot TS3. This timeslot is now assigned; step E3: no localisation module has selected timeslot TS2. The central processing system signals that it is still available by emitting a secondary activation signal at the end of timeslot TS2;	

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
tip of the first active pen	therewith.” Lefevre, ¶0023. It would be obvious to a POSITA that the data transmitted could include force data.	“at step 272, the stylus 130 generates a row information signal for communication to the panel (through its capacitive coupling) during the stylus X transmit period 254(3). The row information signal may be modulated to include button and pressure information.” <i>Id.</i> FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre>
7[b] and a button status of a button on the first active pen.	“For the same mobile element, it is also possible to change its characteristics by modifying one of these parameters upon user action (a ring, a thumbwheel, or a switch on the pen for example). On the basis of these mechanical interventions, a microcontroller present in the localisation module can modify the associated time delay value or transmit data, in particular in the form of a bit stream, indicating that a new function has been selected.” Lefevre ¶0262. Thus, a ring, a thumbwheel, or a switch on the pen could be a button of a pen. Therefore, Lefevre discloses a	Chandran discloses that, during its designated timeslot, the active pen can transmit information such as button status. For example, in Fig. 7, at “step 268, the stylus 130 generates a column information signal for communication to the panel (through its capacitive coupling) during the stylus Y transmit period 254(2). The column information signal may be modulated to include button and pressure information.” Chandran, at 6:34-7:13. Additionally, “at step 272, the stylus 130 generates a row information signal for communication to the panel (through its capacitive coupling) during the stylus X

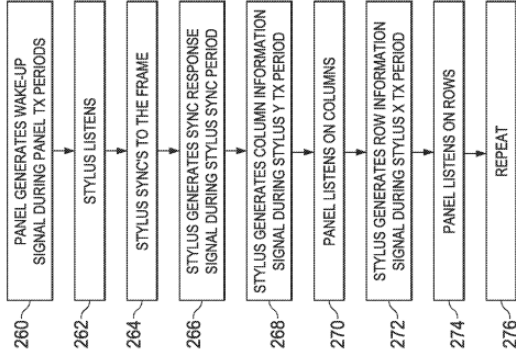
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703.433 (“Chandran”)
	button as a ring, a thumbwheel, or a switch, and Lefevre discloses the transmission of this data.	transmit period 254(3). The row information signal may be modulated to include button and pressure information.” <i>Id.</i> FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre>
Claim 9 9[pre] The processing system of claim 1,	<i>See supra</i> 1[pre] – 1[g].	
9[a] wherein the first downstream packet is transmitted using a first frequency	Lefevre discloses a “command reception and detection module 710” which can “detect the frequency of the carrier associated with the localisation module in question.” Lefevre, ¶0136. Lefevre also discloses that “[t]he analog identification of a localisation module can be performed by sending a dedicated frequency, according to several modes, in particular according to a carrier frequency specific to each localisation module (this frequency identifies the localisation module which is activated).” <i>Id.</i> ¶0147.	

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
9[b] and the second downstream packet is transmitted using a second frequency.	Lefevre discloses that each localisation module can have its own “dedicated frequency . . . according to a carrier frequency specific to each localisation module (this frequency identifies the localisation module which is activated).” Lefevre, ¶0147. A POSITA would understand that this discloses each localisation modules (i.e., the active pens) can transmit their data using different frequencies.	
Claim 10		
10[pre] The processing system of claim 9, wherein:	<i>See supra</i> 9[pre] – 9[b].	<i>See supra</i> 9[pre] – 9[b].
10[a] the sensor module is further configured to:	<i>See supra</i> 1[a].	<i>See supra</i> 1[a].
10[b] initiate a prior beacon period by broadcasting a prior beacon; and	Lefevre discloses that the first timeslot TS0 initiates the previous a periodic pulse of period P1 (corresponding to the prior beacon period) by broadcasting the previous common activation signal (corresponding to the prior beacon). <i>Id.</i> ¶¶0210-0214, 0221-0225. The above process corresponds to initiating a prior beacon period by broadcasting a prior beacon. Lefevre further discloses that in the prior beacon period, during the timeslot TS0, the unpaired localisation module transmits a signal (corresponding to the ACK of the prior beacon), and if the central processing system receives a signal from the localisation module at the timeslot TS0, the central processing system emits a secondary activation signal at the end of each unassigned timeslot. In this case, the timeslot TS0 is occupied by the localisation module. Then, after all the timeslots are allocated to corresponding	Chandran discloses that “[i]n step 260, the control circuitry 120 causes a wake-up signal to be applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 252. The wake-up signal may take the form of the periodic signal discussed above. The wake-up signal may be modulated to carry information if desired. In step 262, the stylus 130 (through its capacitive coupling to the panel) operates in a listen mode and senses change capacitance at the nodes 113 due to the wake-up signal applied by the panel control circuitry 120. From sensing the panel transmitted wake-up signal during the periods 252, the stylus 130 is able to synchronize itself in step 264 to the communications frame 250 and thus know the timing location of the stylus transmit periods 254(1)-254(3).” Chandran at 6:37-6:52.

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) localisation modules, at the beginning of each periodic pulse of period P1, the central processing system sends an activation instruction (corresponding to an uplink packet) to all the localisation modules that transmit signals and occupy corresponding time slots. <i>Id.</i> ¶¶0213-0231.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 7 260 PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS 262 STYLUS LISTENS 264 STYLUS SYNC'S TO THE FRAME 266 STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD 268 STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD 270 PANEL LISTENS ON COLUMNS 272 STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD 274 PANEL LISTENS ON ROWS 276 REPEAT Additionally, Chandran discloses that, in situations with multiple styli, “an initialization or configuration (as with a pairing) operation as shown in FIG. 9 is executed where the stylus identification information in the wake-up signal sent in step 360 is shared in common by a class or group of styluses. Any stylus proximate enough to the panel will receive the wake-up signal in step 362. The receiving stylus 130 functions to compare its stylus identification value to the common identification information included in the wake-up signal (step 364). If there is a match or correlation regarding identification, the stylus 130 will synchronize itself in step 366 to the communications frame 250 and generate the responsive sync signal for communication back to the panel confirming synchronization to the panel in step 368. <i>Id.</i> at 7:57-8:48.

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
10 c receive, during a timeslot of the prior beacon period, an acknowledgement from the first active pen in response to the prior beacon,		 FIG. 9 These processes of generating a “wake-up signal” correspond to a prior beacon. As discussed above, Chandran discloses that, in response to the wake-up signal, “[i]f there is a match or correlation regarding identification, the stylus 130 will synchronize itself in step 366 to the communications frame 250 and generate the responsive sync signal for communication back to the panel confirming synchronization to the panel in step 368. Chandran at 7:35-7:41. A POSITA would understand that the “responsive sync signal” functions as an acknowledgment.
10 d receive, during a timeslot of the prior beacon period, an acknowledgement from the first active pen in response to the prior beacon,	Lefevre further discloses that in the prior beacon period, during the timeslot TS0, the unpaired localisation module transmits a signal (corresponding to the ACK of the prior beacon), and if the central processing system receives a signal from the localisation module at the timeslot TS0, the central processing system emits a secondary activation signal at the end of each unassigned timeslot. In this case, the timeslot TS0 is occupied by the localisation module. Then, after all the timeslots are allocated to corresponding localisation modules, at the beginning of each periodic pulse	

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) of period P1, the central processing system sends an activation instruction (corresponding to an uplink packet) to all the localisation modules that transmit signals and occupy corresponding time slots. <i>Id.</i> ¶¶0213-0231. Thus, Lefevre discloses that the upstream packet as an activation instruction is generated in response to the acknowledgement, and the upstream packet as an activation instruction further specifies the first timeslot.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		<pre> graph TD 360[PANEL GENERATES WAKE-UP SIGNAL WITH COMMON ID] --> 362[STYLUSES LISTEN] 362 --> 364{ID MATCH ?} 364 -- NO --> 374[IGNORE] 364 -- YES --> 366[STYLUSES SYNC TO FRAME] 366 --> 368[STYLUSES GENERATE SYNC RESPONSE SIGNAL WITH UNIQUE ID] 368 --> 370[PANEL LISTENS] 370 --> 372[STORE STYLUSES ID'S] </pre> FIG. 9
10[d] wherein the first active pen is unpaired during a portion of the prior beacon period,	Lefevre further discloses that “the first timeslot TS0 begins at the moment of emission of an activation “instruction” of the common activation signal. It is specific and reserved for the arrival of new localisation modules”. <i>Id.</i> ¶0212. The new localisation modules correspond to the unpaired localisation modules or the nonactivated localisation modules. Thus, Lefevre discloses that the first active pen is unpaired during a portion of the prior beacon period.	Chandran discloses “in step 266, the stylus 130 generates a sync signal for communication to the panel (through its capacitive coupling) during the stylus sync transmit period 254(1) confirming synchronization to the panel and advising the panel to anticipate subsequent communication from the stylus.” Chandran, at 6:52-6:56. This is in response to the wake-up signal, meaning that the stylus was unpaired at the time it received the wake-up signal initializing the prior beacon period.

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 7  <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre> Additionally, Chandran discloses that, with multiple pens, “After the initialization or configuration operation of FIG. 9 is completed, the process of FIG. 7 may be executed with the wake-up signals sent in step 260 modulated to include the unique identification information of particular styluses and thus control the conversation between the panel and each stylus. This operation is illustrated in the timing diagram of FIG. 10. The process of step 262 for having the stylus listen for the wake-up signal would further include, like that shown in step 364 of FIG. 9, an operation performed by the stylus to compare its stylus identification value to the unique identification information contained in the wake-up signal. The remaining steps of FIG. 7 would be performed by that stylus only if there was an identification match. In the absence of a match, in either FIG. 7 or FIG. 9, the stylus would ignore (step 374) the wake-up signal.” <i>Id.</i> at 8:13-8:28.

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		<pre> graph TD 360[PANEL GENERATES WAKE-UP SIGNAL WITH COMMON ID] --> 362[STYLUSES LISTEN] 362 --> 364{ID MATCH?} 364 -- YES --> 366[STYLUSES SYNC TO FRAME] 366 --> 368[STYLUSES GENERATE SYNC RESPONSE SIGNAL WITH UNIQUE ID] 368 --> 370[PANEL LISTENS] 370 --> 372[STORE STYLUSES ID'S] 364 -- NO --> 374[IGNORE] </pre> FIG. 9 “The responsive signal [from the stylus] is modulated with information providing the unique identification of the responding stylus. The panel listens in step 370 and the control circuitry 120 is provided with the unique identification from the responding styluses. The unique identification of each responding stylus is stored (in step 372) so as to allow the control circuitry 120 to maintain a record of associated styluses and their identification values.” <i>Id.</i> at 8:7-8:12.

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
10[e] wherein the upstream packet is generated in response to the acknowledgement, and	See Lefevre ¶¶0213-0231 (specifying first timeslot (upstream packet) generated in response to acknowledgment)	Chandran discloses Figure 4, “which illustrates a flow diagram for an implementation of the communication protocol useful for the communication mode. A corresponding timing diagram is illustrated in FIG. 5. In step 160, the control circuitry 120 causes a periodic signal to be applied to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 152. This signal transmission may, for example, comprise a wake-up or polling message, with the active stylus functioning in a sleep mode waiting for receipt of the message. In step 162, the stylus 130 (through its capacitive coupling to the panel) operates in a listen mode (including for example a low power or sleep mode) and senses change in capacitance at the nodes 113 due to the periodic signal applied by the panel control circuitry 120. From sensing the panel transmitted periodic signal during the periods 152, the stylus 130 is activated and functions to synchronize itself in step 164 to the communications frame 150 and thus know the timing location of the stylus transmit periods 154. In step 166, the stylus 130 generates an information signal for communication to the panel (through its capacitive coupling) during the stylus transmit period 154 of the time division multiplexed frame. The panel operates in a listen mode during the stylus transmit period 154 in step 168 and recovers the transmitted information. In step 170, the panel generates an information signal for communication to the stylus 130 during the panel transmit period 152. The stylus 130 (through its capacitive coupling to the panel) operates in a listen mode during the panel transmit period 152 in step 172 and recovers the transmitted information. The steps 166-172 are repeated in accordance with the self-scan frame 150 to support communication from the panel, communication from the

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
10[f] wherein the upstream packet further specifies the first timeslot and the first frequency.		stylus or bidirectional communication of information between the panel and stylus.” <pre> graph TD 160[160 PANEL GENERATES PERIODIC SIGNAL DURING PANEL TX PERIODS] --> 162[162 STYLUS LISTENS] 162 --> 164[164 STYLUS SYNC'S TO THE FRAME] 164 --> 166[166 STYLUS GENERATES INFORMATION SIGNAL DURING STYLUS TX PERIODS] 166 --> 168[168 PANEL LISTENS] 168 --> 170[170 PANEL GENERATES INFORMATION SIGNAL DURING PANEL TX PERIODS] 170 --> 172[172 STYLUS LISTENS] subgraph DashedBox [] 166 168 170 172 end </pre> FIG. 4 Thus, in step 170, upstream packet from the input device is generated in response to the acknowledgement. Chandran discloses “an implementation of the communication protocol useful for the communication mode.” Chandran, 5:12-5:45. As part of that protocol, “[f]rom sensing the panel transmitted periodic signal during the periods 152, the stylus 130 is activated and functions to synchronize itself in step 164 to the communications frame 150 and thus know the timing location of the stylus transmit periods 154.” <i>Id.</i> 5:26-5:30. A POSITA would understand that the upstream packet must specify a timeslot for active pen communication, because the stylus “know[s] the timing location of the stylus transmit periods.” <i>Id.</i>
10[g] wherein the upstream packet further specifies the first timeslot and the first frequency.	Lefevre further discloses that “the analog identification of a localisation module can be performed by sending a dedicated frequency, according to several modes, in particular according to a carrier frequency specific to each localisation module (this frequency identifies the localisation module which is activated)”. And Lefevre further discloses that “since the localisation modules only emit during timeslots assigned to them, the central processing system is able to identify from which localisation module the received data originate”. Lefevre ¶¶0147, 0240.	

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
Claim 12 (Ind. Claim) 12 prel A method for operating a processing system of an input device, comprising:	Lefevre discloses an input device with a processing system. Specifically, Lefevre discloses a board 105, or an input device, which “comprises a detection surface 115 coupled to a screen 120 and a magnetized surface 125 (the detection surface 115, the screen 120, and the magnetized surface 125 are here substantially parallel).” Lefevre ¶0057. The board 105 (the input device) also “comprises a hardware module 130 (or central processing system).” <i>Id.</i> “The hardware module 130 typically comprises a calculation module and a control module for position detection and capture, as detailed below. The calculation module is fitted here with a central processing unit (CPU), a graphics processing unit (GPU), memory components (Random Access Memory (RAM), Read Only Memory (ROM), and/or Flash type memory) to store the programs and variables needed for the implementation of the invention as well as an audio processing module in the form, for example, of a chipset.” <i>Id.</i> ¶0059.	Chandran discloses an input device with a processing system. Specifically, Chandran discloses “a capacitive sensing panel 100” (the input device) that “is of a type useful for a touchscreen panel for an electronic device such as a smart phone, GPS device, tablet computer, mobile media player, remote control device, or any other device capable of using a touchscreen panel.” Chandran, at 1:24-1:29. A POSITA would understand that such devices include a processing system. Chandran also discloses that “[i]t is thus possible for the control circuitry 120 and active stylus 130 to engage in a bidirectional communication.” <i>Id.</i> at 2:49-2:50. A POSITA would understand that a processing system is required for such communication.
12 a] generating an upstream packet for a first active pen specifying a pen identification (ID) associated with the first active pen;	Lefevre discloses that “the activation of all the localisation modules is initiated by a central processing system (control module for position detection and capture) with a common activation signal, each localisation module independently determining its activation as a function of the common activation signal.” Lefevre, at ¶0192. Lefevre further explains that “said activation signal is a common activation signal for common control of the activation of a plurality of localisation modules.” <i>Id.</i> ¶0017. Thus, transmitting, by a central processing system (control module for position detection and capture), a common activation signal to all the localisation modules of a plurality of mobile elements 110, corresponds to broadcasting a current beacon signal to a	Chandran discloses that the control circuitry of the touchpad “causes a wake-up signal to be applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 252.” Chandran, at 6:37-6:44. “The wake-up signal may be modulated to carry information if desired.” <i>Id.</i>

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) plurality of active pens comprising a first active pen. Lefevre discloses “a common activation signal, denoted sync” and an upstream packet included in the common activation signal as “an activation instruction included in a common activation signal, denoted sync.” <i>Id.</i> ¶0194. Lefevre further discloses the upstream packet contains the index i or the identification code, specifying a corresponding index i or an identification code associated with a mobile element, which a POSITA would understand to be specifying a pen ID associated with the active pen. <i>See id.</i> ¶¶0165-0166.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre> “In an embodiment, the wake-up signal applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 152 and step 260 may be modulated to include stylus identification information (i.e., the identification of the stylus with whom the panel wishes to communicate). The stylus identification information may comprise an identification that is unique to a particular stylus or instead is more generic and applicable to a class or group of styluses. Any stylus proximate enough to the panel will receive the wake-up signal in step 262. The receiving stylus 130 functions to compare its stylus identification value to the stylus identification information included in the wake-up signal.”

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		<i>Id.</i> at 7:23-7:43. Thus, a POSITA would understand the signal (or beacon) from the panel (or input device) contains a pen ID. FIG. 8 Additionally, Chandran discloses that, with respect to Fig. 4, “[i]n step 160, the control circuitry 120 causes a periodic signal to be applied to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 152. This signal transmission may, for example, comprise a wake-up or polling message, with the active stylus functioning in a sleep mode waiting for receipt of the message. . . . In an embodiment, the periodic signal may comprise a dedicated frequency (carrier) signal that is injected into each column 115 and row 117 of interconnected capacitive-sensing nodes 113 by the control circuitry 120. The periodic signal may, if desired, be modulated with information to be communicated to the stylus from the panel.” <i>Id.</i> at 5:12-5:53. Thus, a POSITA would understand the signal (or beacon) from the panel (or input device) contains a frequency.

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 4 Additionally, Chandran discloses “a time division multiplexed operation” communication mode for communication to and/or from the active stylus. <i>See id.</i> at 4:51-5:8, Fig. 3:

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		“From sensing the panel transmitted periodic signal during the periods 152, the stylus 130 is activated and functions to synchronize itself in step 164 to the communications frame 150 and thus know the timing location of the stylus transmit periods 154.” <i>Id.</i> at 5:26-30. “From sensing the panel transmitted wake-up signal during the periods 252, the stylus 130 is able to synchronize itself in step 264 to the communications frame 250 and thus know the timing location of the stylus transmit periods 254(1)-254(3).” <i>Id.</i> at 6:47-52.
12[b] initiating a current beacon period comprising a plurality of timeslots by broadcasting, to a plurality of active pens comprising the first active pen, a current beacon signal comprising the upstream packet;	Lefevre discloses that “the activation of all the localisation modules is initiated by a central processing system (control module for position detection and capture) with a common activation signal, each localisation module independently determining its activation as a function of the common activation signal.” Lefevre, at ¶0192. Lefevre further explains that “said activation signal is a common activation signal for common control of the activation of a plurality of localisation modules.” <i>Id.</i> ¶0017. Thus, transmitting, by a central processing system (control module for position detection and capture), a common activation signal to all the localisation modules of a plurality of mobile elements 110, corresponds to broadcasting a current beacon signal to a plurality of active pens comprising a first active pen. Lefevre discloses that a current beacon signal as “a common activation signal, denoted sync” and an upstream packet included in a current beacon signal as “an activation instruction included in a common activation signal, denoted sync.” <i>Id.</i> ¶0194. Lefevre further discloses the upstream packet contains the index i or the identification code, specifying a corresponding index i or an identification code associated with a mobile element, which a POSITA would	Chandran discloses that the control circuitry of the touchpad “causes a wake-up signal to be applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 252.” Chandran, at 6:37-6:44. “The wake-up signal may be modulated to carry information if desired.” <i>Id.</i>

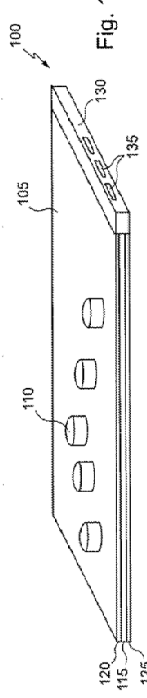
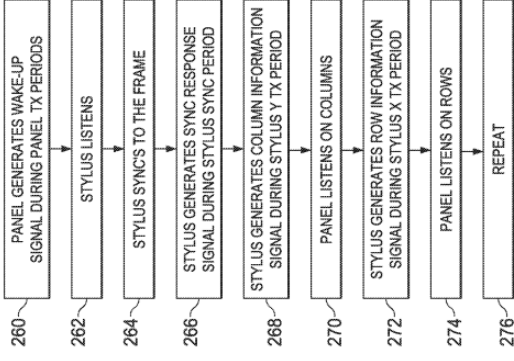
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) understand to be specifying a pen ID associated with the active pen. <i>See id.</i> ¶¶0165-0166. Lefevre discloses that the first timeslot TS0 initiates the previous a periodic pulse of period P1 (corresponding to the prior beacon period) by broadcasting the previous common activation signal (corresponding to the prior beacon). <i>Id.</i> ¶¶0210-0214, 0221-0225. The above process corresponds to initiating a prior beacon period by broadcasting a prior beacon. Lefevre further discloses that “the first timeslot TS0 begins at the moment of emission of an activation “instruction” of the common activation signal. It is specific and reserved for the arrival of new localisation modules”. <i>Id.</i> ¶0212. The new localisation modules correspond to the unpaired localisation modules or the nonactivated localisation modules. Thus, Lefevre discloses that the first active pen is unpaired during a portion of the prior beacon period. Lefevre further discloses that in the prior beacon period, during the timeslot TS0, the unpaired localisation module transmits a signal (corresponding to the ACK of the prior beacon), and if the central processing system receives a signal from the localisation module at the timeslot TS0, the central processing system emits a secondary activation signal at the end of each unassigned timeslot. In this case, the timeslot TS0 is occupied by the localisation module. Then, after all the timeslots are allocated to corresponding localisation modules, at the beginning of each periodic pulse of period P1, the central processing system sends an activation instruction (corresponding to an uplink packet) to all the localisation modules that transmit signals and occupy corresponding time slots. <i>Id.</i> ¶¶0213-0231. Thus, Lefevre	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)	FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre> “In an embodiment, the wake-up signal applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 152 and step 260 may be modulated to include stylus identification information (i.e., the identification of the stylus with whom the panel wishes to communicate). The stylus identification information may comprise an identification that is unique to a particular stylus or instead is more generic and applicable to a class or group of styluses. Any stylus proximate enough to the panel will receive the wake-up signal in step 262. The receiving stylus 130 functions to compare its stylus identification value to the stylus identification information included in the wake-up signal.”
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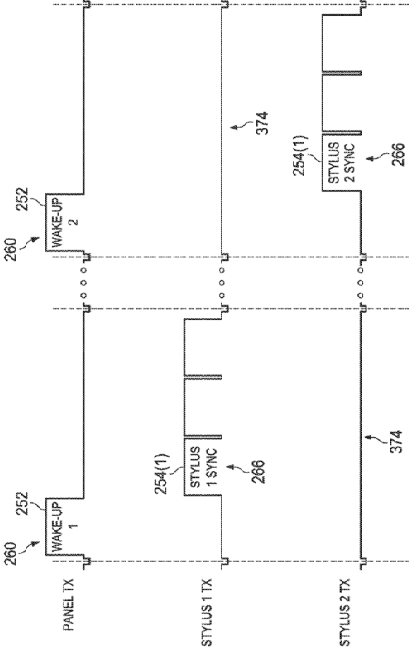
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) discloses that the upstream packet as an activation instruction is generated in response to the acknowledgement, and the upstream packet as an activation instruction further specifies the first timeslot. Lefevre further discloses that “the analog identification of a localisation module can be performed by sending a dedicated frequency, according to several modes, in particular according to a carrier frequency specific to each localisation module (this frequency identifies the localisation module which is activated)”. And Lefevre further discloses that “since the localisation modules only emit during timeslots assigned to them, the central processing system is able to identify from which localisation module the received data originate”. ¶¶0147, 0240.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”) <i>Id.</i> at 7:23-7:43. Thus, a POSITA would understand the signal (or beacon) from the panel (or input device) contains a pen ID. FIG. 8 Additionally, Chandran discloses that, with respect to Fig. 4, “[i]n step 160, the control circuitry 120 causes a periodic signal to be applied to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 152. This signal transmission may, for example, comprise a wake-up or polling message, with the active stylus functioning in a sleep mode waiting for receipt of the message. . . . In an embodiment, the periodic signal may comprise a dedicated frequency (carrier) signal that is injected into each column 115 and row 117 of interconnected capacitive-sensing nodes 113 by the control circuitry 120. The periodic signal may, if desired, be modulated with information to be communicated to the stylus from the panel.” <i>Id.</i> at 5:12-5:53. Thus, a POSITA would understand the signal (or beacon) from the panel (or input device) contains a frequency.
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Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 4 Additionally, Chandran discloses “a time division multiplexed operation” communication mode for communication to and/or from the active stylus. <i>See id.</i> at 4:51-5:8, Fig. 3: “From sensing the panel transmitted periodic signal during the periods 152, the stylus 130 is activated and functions to

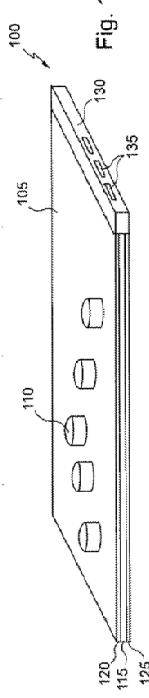
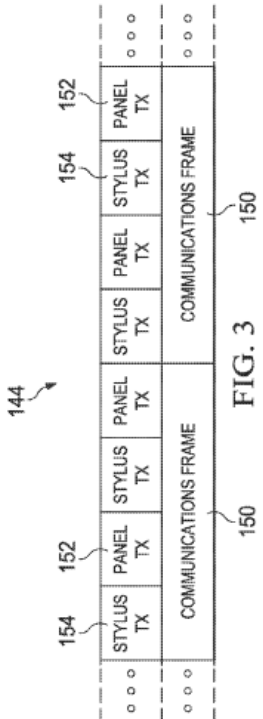
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		synchronize itself in step 164 to the communications frame 150 and thus know the timing location of the stylus transmit periods 154.” <i>Id.</i> at 5:26-30. “From sensing the panel transmitted wake-up signal during the periods 252, the stylus 130 is able to synchronize itself in step 264 to the communications frame 250 and thus know the timing location of the stylus transmit periods 254(1)-254(3).” <i>Id.</i> at 6:47-52.
12 c receiving, during a first timeslot, a first downstream packet from a first active pen transceiver over a first frequency;	Lefevre discloses that the mobile elements (i.e., the active pens) have a localisation module with a “means for emitting a signal making it possible to calculate the position of said localization module,” as well as a “means for receiving an activation signal” from a computer. Lefevre, at ¶¶0010, 0027-0031. Because the localization module of the mobile element can transmit and receive signals, a POSITA would understand that it has a transceiver. Lefevre discloses that, during its designated timeslot, the active pen can transmit information such as button status. <i>See, e.g.</i>, Lefevre at ¶¶0261-0262 (“In addition, specific characteristics (colour, eraser or line thickness function for a mobile element representing a pencil) can be associated with the different mobile elements. They can be transmitted by the localisation modules (directly or as a function of associated time delay values), as described above. The selection of a function or colour can be displayed on the object comprising the localisation module in question by dedicated Light-Emitting Diode (LED) display, for example. For the same mobile element, it is also possible to change its characteristics by modifying one of these parameters upon user action (a ring, a thumbwheel, or a switch on the pen for example). On the basis of these mechanical interventions, a microcontroller present in the localisation module can modify the associated time delay value or transmit data, in	Chandran discloses that it is “possible for the control circuitry 120 and the active stylus 130 to engage in a bidirectional communication.” Chandran, at 2:49-60. The control circuitry 120 is a component of the capacitive sensing panel (i.e., a touchpad). <i>See id.</i> at Fig. 1; <i>id.</i> at 2:23-2:24. Because the control circuitry of the touchpad and the active stylus engage in bidirectional communication, a POSITA would understand that the active stylus has a transceiver.
		Chandran also discloses “an embodiment of an operating protocol for the communication mode.” <i>Id.</i> at 4:53-5:8. The operating protocol disclosed “comprises a time division multiplexed operation in accordance with a repeating communications frame 150, wherein each frame 150 includes at least one panel transmit period 152 and at least one stylus transmit period 154.” <i>Id.</i> “During the panel transmit period 152, the control circuitry 120 drives a signal possibly modulated by information (data) on the interconnected nodes 113 of the columns 115 and/or rows 117 of the capacitive sensing panel. The active stylus 130 is capacitively coupled to the panel and operable to sense the panel transmit signal and recover any information contained in that signal. Conversely, during the stylus transmit period 154, the stylus 130 generates a signal possibly modulated by information (data) and capacitively coupled to the rows and columns of the panel. The control circuitry 120 of the panel functions to

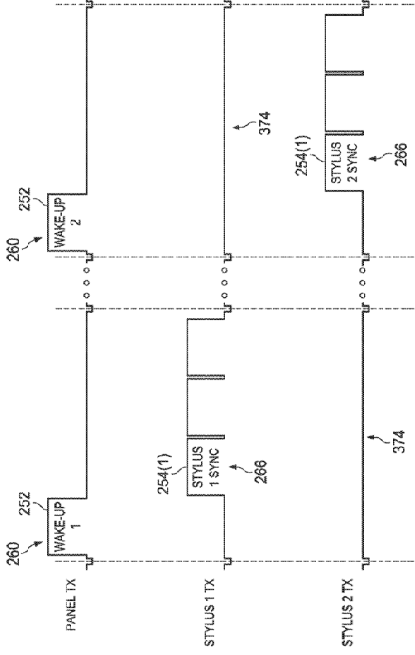
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) particular in the form of a bit stream, indicating that a new function has been selected.”). Lefevre discloses a “command reception and detection module 710” which can “detect the frequency of the carrier associated with the localisation module in question.” Lefevre, ¶0136. Lefevre also discloses that “[t]he analog identification of a localisation module can be performed by sending a dedicated frequency, according to several modes, in particular according to a carrier frequency specific to each localisation module (this frequency identifies the localisation module which is activated).” <i>Id.</i> ¶0147.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”) sense the capacitive change on nodes 113 and recover any information sent by the stylus 130. It will be understood that the illustration of two panel transmit periods 152 interleaved with two stylus transmit periods 154 in one frame 150 is exemplary only of a basic communications protocol.” <i>Id.</i> This exemplifies the bidirectional communication. FIG. 3 Chandran discloses that, during its designated timeslot, the active pen can transmit information such as button status. For example, in Fig. 7, at “step 268, the stylus 130 generates a column information signal for communication to the panel (through its capacitive coupling) during the stylus Y transmit period 254(2). The column information signal may be modulated to include button and pressure information.” Chandran, at 6:34-7:13. Additionally, “at step 272, the stylus 130 generates a row information signal for communication to the panel (through its capacitive coupling) during the stylus X transmit period 254(3). The row information signal may be modulated to include button and pressure information.” <i>Id.</i>
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Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
12[d] receiving, during a second timeslot, a second downstream packet from a second active pen second active pen transceiver over a second frequency; and	Lefevre discloses the concurrent use of multiple mobile elements. <i>See</i> Lefevre, at ¶0056 (“Although only five mobile elements are shown here, it is possible to use several tens or even several hundreds.”); <i>see also</i> Fig. 1:  Fig. 1 It would be obvious to a POSITA that the embodiments disclosed in Lefevre described in 12[c] would apply to a second active pen.	FIG. 7  Chandran discloses the concurrent use of multiple styluses, or active pens. <i>See, e.g.</i>, Chandran at 7:44-7:45 (“The foregoing process facilitates the association of multiple styluses to a single panel.”); <i>id.</i> at 7:57-7:58 (“To facilitate a multiple stylus association, the control circuitry 120 must be able to identify each associated stylus.”); <i>see also</i> Fig. 10:

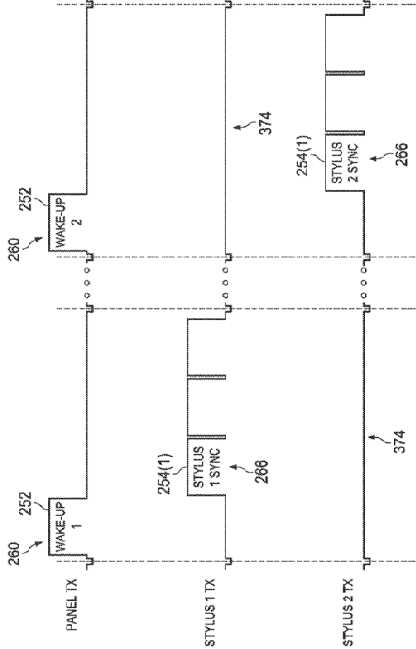
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
12[e] determining an attribute of the first active pen comprising the first active pen transceiver from at least the first downstream packet.	Lefevre discloses that, during its designated timeslot, the active pen can transmit information such as button status. <i>See, e.g.,</i> Lefevre at ¶¶0261-0262 (“In addition, specific characteristics (colour, eraser or line thickness function for a mobile element representing a pencil) can be associated with the different mobile elements. They can be transmitted by the localisation modules (directly or as a function of associated time delay values), as described above. The selection of a function or colour can be displayed on the object comprising the localisation module in question by dedicated Light-Emitting Diode (LED) display, for example. For the same mobile element, it is also possible to change its characteristics by modifying one of these parameters upon user action (a ring, a thumbwheel, or a switch on the pen for example). On the basis of these mechanical interventions, a microcontroller present in the localisation module can	 FIG. 10 It would be obvious to a POSITA that the embodiments disclosed in Chandran described in 1[c] would apply to a second active pen.
12[e] determining an attribute of the first active pen comprising the first active pen transceiver from at least the first downstream packet.	Lefevre discloses that, during its designated timeslot, the active pen can transmit information such as button status. <i>See, e.g.,</i> Lefevre at ¶¶0261-0262 (“In addition, specific characteristics (colour, eraser or line thickness function for a mobile element representing a pencil) can be associated with the different mobile elements. They can be transmitted by the localisation modules (directly or as a function of associated time delay values), as described above. The selection of a function or colour can be displayed on the object comprising the localisation module in question by dedicated Light-Emitting Diode (LED) display, for example. For the same mobile element, it is also possible to change its characteristics by modifying one of these parameters upon user action (a ring, a thumbwheel, or a switch on the pen for example). On the basis of these mechanical interventions, a microcontroller present in the localisation module can	Chandran discloses that, during its designated timeslot, the active pen can transmit information such as button status. For example, in Fig. 7, at “step 268, the stylus 130 generates a column information signal for communication to the panel (through its capacitive coupling) during the stylus Y transmit period 254(2). The column information signal may be modulated to include button and pressure information.” Chandran, at 6:34-7:13. Additionally, “at step 272, the stylus 130 generates a row information signal for communication to the panel (through its capacitive coupling) during the stylus X transmit period 254(3). The row information signal may be modulated to include button and pressure information.” <i>Id.</i>

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) modify the associated time delay value or transmit data, in particular in the form of a bit stream, indicating that a new function has been selected.”).	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 7 <pre> graph TD 260[260 PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[262 STYLUS LISTENS] 262 --> 264[264 STYLUS SYNC'S TO THE FRAME] 264 --> 266[266 STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[268 STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[270 PANEL LISTENS ON COLUMNS] 270 --> 272[272 STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[274 PANEL LISTENS ON ROWS] 274 --> 276[276 REPEAT] </pre>
Claim 13		
13[pre] The method of claim 12,	<i>See supra</i> 12[pre] – 12[e].	<i>See supra</i> 12[pre] – 12[e].
13[a] wherein the first active pen further comprises the second active pen transceiver, and	Lefevre discloses that the mobile elements 110 (i.e., the active pens) have a localisation module with a “means for emitting a signal making it possible to calculate the position of said localization module,” as well as a “means for receiving an activation signal” from a computer. Lefevre, at ¶¶0010, 0027-0031. Because the localization module of the mobile element can transmit and receive signals, a POSITA would understand that it has a transceiver. Lefevre discloses the concurrent use of multiple mobile elements. <i>See</i> Lefevre, at ¶0056 (“Although only five mobile elements are shown here, it is possible to use several tens or even several hundreds.”); <i>see also</i> Fig. 1:	Chandran discloses that it is “possible for the control circuitry 120 and the active stylus 130 to engage in a bidirectional communication.” Chandran, at 2:49-60. The control circuitry 120 is a component of the capacitive sensing panel (i.e., a touchpad). <i>See id.</i> at Fig. 1; <i>id.</i> at 2:23-2:24. Because the control circuitry of the touchpad and the active stylus engage in bidirectional communication, a POSITA would understand that the active stylus has a transceiver. Chandran also discloses “an embodiment of an operating protocol for the communication mode.” <i>Id.</i> at 4:53-5:8. The operating protocol disclosed “comprises a time division multiplexed operation in accordance with a repeating

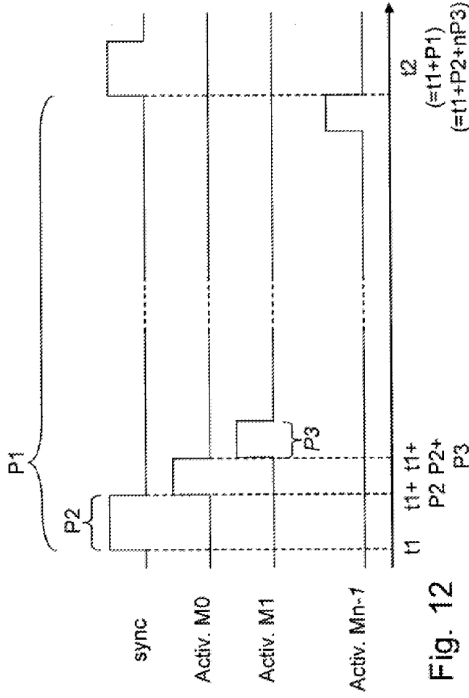
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	 Fig. 1	communications frame 150, wherein each frame 150 includes at least one panel transmit period 152 and at least one stylus transmit period 154.” <i>Id.</i> “During the panel transmit period 152, the control circuitry 120 drives a signal possibly modulated by information (data) on the interconnected nodes 113 of the columns 115 and/or rows 117 of the capacitive sensing panel. The active stylus 130 is capacitively coupled to the panel and operable to sense the panel transmit signal and recover any information contained in that signal. Conversely, during the stylus transmit period 154, the stylus 130 generates a signal possibly modulated by information (data) and capacitively coupled to the rows and columns of the panel. The control circuitry 120 of the panel functions to sense the capacitive change on nodes 113 and recover any information sent by the stylus 130. It will be understood that the illustration of two panel transmit periods 152 interleaved with two stylus transmit periods 154 in one frame 150 is exemplary only of a basic communications protocol.” <i>Id.</i> This exemplifies the bidirectional communication.  FIG. 3 Chandran discloses the concurrent use of multiple styluses, or active pens. <i>See, e.g.,</i> Chandran at 7:44-7:45 (“The foregoing process facilitates the association of multiple styluses to a single panel.”); <i>id.</i> at 7:57-7:58 (“To facilitate a multiple

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
13 b] wherein the attribute of the first active pen is further determined from the second downstream packet.		stylus association, the control circuitry 120 must be able to identify each associated stylus.”); <i>see also</i> Fig. 10:  FIG. 10 Thus, it would be obvious to a POSITA that each stylus has a transceiver.
13 b] wherein the attribute of the first active pen is further determined from the second downstream packet.	Lefevre discloses a “method [that] further comprises a step to transmit at least one item of data from said at least one localisation module to said computer system. Said at least one item of data can in particular be representative of an identifier of said at least one localisation module. In this case, it allow [sic], the computer system to associate a position with a localisation module. It can also be representative of a state of the localisation module or a function associated therewith.” Lefevre ¶0023. A POSITA would understand that, from this information transmitted from the second downstream packet from the second active pen, the processing system would determine an attribute of the first active pen, in that it would determine	Chandran discloses a method for the synchronization and use of multiple styluses: “To facilitate a multiple stylus association, the control circuitry 120 must be able to identify each associated stylus. To accomplish this goal, an initialization or configuration (as with a pairing) operation as shown in FIG. 9 is executed where the stylus identification information in the wake-up signal sent in step 360 is shared in common by a class or group of styluses. Any stylus proximate enough to the panel will receive the wake-up signal in step 362. The receiving stylus 130 functions to compare its stylus identification value to the common identification information included in the wake-up signal (step 364). If there is a match or correlation regarding identification, the stylus 130 will synchronize itself in step

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) that the first active pen is different than the second active pen.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		366 to the communications frame 250 and generate the responsive sync signal for communication back to the panel confirming synchronization to the panel in step 368. The responsive signal is modulated with information providing the unique identification of the responding stylus. The panel listens in step 370 and the control circuitry 120 is provided with the unique identification from the responding styluses. The unique identification of each responding stylus is stored (in step 372) so as to allow the control circuitry 120 to maintain a record of associated styluses and their identification values.” Chandran at 7:57-8:12. <pre> graph TD 360[PANEL GENERATES WAKE-UP SIGNAL WITH COMMON ID] --> 362[STYLUSES LISTEN] 362 --> 364{ID MATCH ?} 364 -- NO --> 374[IGNORE] 364 -- YES --> 366[STYLUSES SYNC TO FRAME] 366 --> 368[STYLUSES GENERATE SYNC RESPONSE SIGNAL WITH UNIQUE ID] 368 --> 370[PANEL LISTENS] 370 --> 372[STORE STYLUSES ID'S] </pre> FIG. 9 A POSITA would understand that, from this information transmitted from the second downstream packet from the second active pen, the processing system would determine an

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		attribute of the first active pen, in that it would determine that the first active pen is different than the second active pen.
Claim 14		
14[pre] The method of claim 12, further comprising:	<i>See supra</i> 12[pre] – 12[e].	<i>See supra</i> 12[pre] – 12[e].
14[a] determining an attribute of a second active pen comprising the second active pen transceiver from the second downstream packet.	Lefevre discloses that, during its designated timeslot, the active pen can transmit information such as button status. <i>See, e.g.,</i> Lefevre at ¶¶0261-0262 (“In addition, specific characteristics (colour, eraser or line thickness function for a mobile element representing a pencil) can be associated with the different mobile elements. They can be transmitted by the localisation modules (directly or as a function of associated time delay values), as described above. The selection of a function or colour can be displayed on the object comprising the localisation module in question by dedicated Light-Emitting Diode (LED) display, for example. For the same mobile element, it is also possible to change its characteristics by modifying one of these parameters upon user action (a ring, a thumbwheel, or a switch on the pen for example). On the basis of these mechanical interventions, a microcontroller present in the localisation module can modify the associated time delay value or transmit data, in particular in the form of a bit stream, indicating that a new function has been selected.”). Lefevre discloses the concurrent use of multiple mobile elements. <i>See</i> Lefevre, at ¶0056 (“Although only five mobile elements are shown here, it is possible to use several tens or even several hundreds.”); <i>see also</i> Fig. 1:	Chandran discloses the concurrent use of multiple styluses, or active pens. <i>See, e.g.,</i> Chandran at 7:44-7:45 (“The foregoing process facilitates the association of multiple styluses to a single panel.”); <i>id.</i> at 7:57-7:58 (“To facilitate a multiple stylus association, the control circuitry 120 must be able to identify each associated stylus.”); <i>see also</i> Fig. 10:  FIG. 10 It would be obvious to a POSITA that the embodiments disclosed in Chandran described in 2[a] and 13[b] would apply to a second active pen.

Claim Elements U.S. Patent No. 9,977,519	Fig. 1	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
Claim 16			
16[pre] The method claim 14, further comprising:	<i>See supra</i> 14[pre] – 14[a].	<i>See supra</i> 14[pre] – 14[a].	
16[a] detecting a collision between the first active pen and the second active pen; and	Lefevre discloses that “a common activation signal, denoted sync, comprises here periodic pulses, of period P1 and duration P2. The purpose of each pulse of the sync signal, representing an activation “instruction”, is the sequential activation of the localisation modules (all or those previously selected)”. Lefevre, at ¶0194. As shown in Figure 12, each periodic pulse of period P1 includes a common activation signal (duration P2) and a plurality of timeslots with a period of P3, corresponding here to the duration of activation of each localisation module (P3 is here defined as $P1 = P2 + n \times P3$, where n represents the number of localisation modules to be activated during a period P1). <i>Id.</i> ¶0196, Fig. 12.	Chandran discloses a scenario where two or more styluses collide with each other. The control circuitry generates wake up signals again, which a POSITA would consider as sending a collision packet. <i>See</i> Chandran, at 8:29-48 (“The transmission of the wake-up signal in step 360 of 3° FIG. 9 is essentially a point to multi-point broadcast communication. It is possible that multiple styluses will receive the wake-up signal, satisfy the matching test of step 364, and want to generate the sync response signal in step 368. This raises a concern that multiple styluses will simultaneously communicate during a single stylus sync period 266. If such simultaneous communications occur from multiple styluses, there is a possibility of the signals stepping on each other and the control circuitry 120 may not receive stylus sync confirmations and stylus identification information. To avoid this, when the control circuitry 120 detects a first stylus, for example through analyzing the location of the stylus relative to the panel, the control circuitry will lock onto the stylus by scanning only the [columns] and rows of that location. When two styluses are close to each other to a degree prohibiting separation by the control circuitry, the control circuitry will	

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	 Fig. 12 Lefevre discloses that “[a]t each cycle and for each free timeslot,” it could occur that “the timeslot has been selected by several localisation modules, which emit during the period of the timeslot: the central processing system detects a collision of signals and continues to indicate that the timeslot is free by emitting a secondary activation signal at the end of the timeslot.” <i>Id.</i> ¶0215.	ignore the styluses and generate wake up signals again as in step 360 of FIG. 9.”).
16 b] sending a collision packet for the first active pen and the second active pen,	Lefevre discloses that “[c]ases of collisions are resolved for example by algorithms such as those mentioned in the section entitled ‘Collision backoff and retransmission’ in the IEEE 802.3 Ethernet standard.” <i>Id.</i> ¶0219.	See Chandran 8:29-48.

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	A POSITA would understand this standard utilizes “collision packets.” <i>See, e.g.</i>, Ex. 1016, IEEE Std 802.3, 2000 Edition, at 4 (“The interface between the MAC sublayer and the Physical Layer includes signals for framing (carrier sense, receive data valid, transmit initiation) and contention resolution (collision detect), facilities for passing a pair of serial bit streams (transmit, receive) between the two layers, and a wait function for timing.”); <i>id.</i> at 47 (“In the event of a collision, the transmitting station’s Physical Layer initially notices the interference on the medium and then turns on the collision detect signal. In half duplex mode, this is noticed in turn by the Transmit Media Access Management component of the MAC sublayer, and collision handling begins. First, Transmit Media Access Management enforces the collision by transmitting a bit sequence called jam.”).	
16[c] wherein each of the first active pen and the second active pen wait a random time interval before reattempting to pair in response to	A POSITA would understand, based on their knowledge of the use of “collision packets” and relevant standards, that, once a collision packet is used, an input device would terminate the transmission and schedule another transmission attempt after a randomly selected time interval. <i>See also</i> Lefevre ¶¶0224-0232:	As discussed above, Chandran discloses that, “When two styluses are close to each other to a degree prohibiting separation by the control circuitry, the control circuitry will ignore the styluses and generate wake up signals again as in step 360 of FIG. 9.” Chandran, at 8:44-48. A POSITA would understand that the wake up signal would be re-sent at a random time interval.

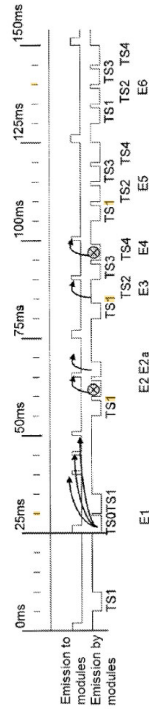
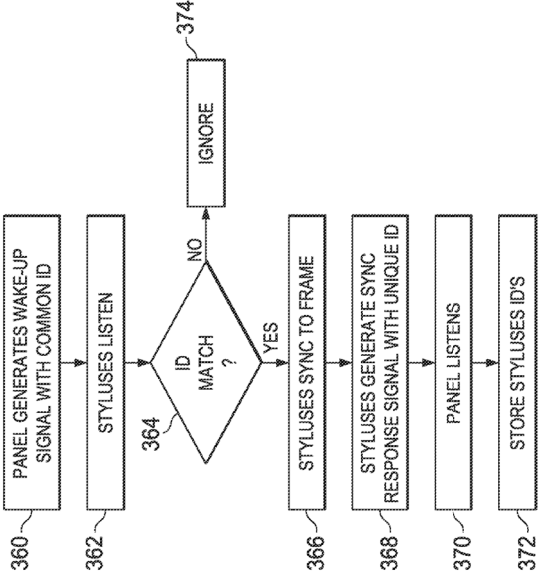


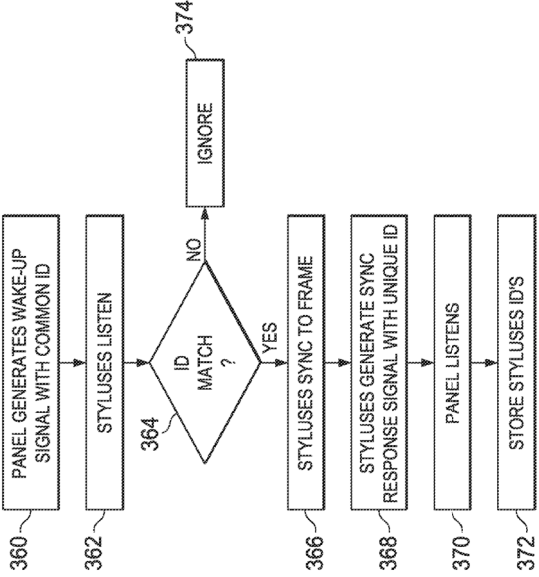
Fig. 14

Claim Elements U.S. Patent No. 9,977,519 the collision packet.	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	Steps E1 to E6 of the timing chart show the allocation of timeslots to localisation modules which appear on the detection surface in question: step E1: new localisation modules (with no allocated timeslot) emit by default on timeslot TS0. In response, the central processing system emits secondary activation signals at the end of the free timeslots (here timeslots TS2, TS3 and TS4). The new localisation modules perform random selections to assign timeslots on the basis of the free timeslots. Two of them select timeslot TS2, a third selects timeslot TS3; step E2: there is a conflict on timeslot TS2. The central processing system signals this by maintaining emission of the secondary activation signal at the end of the timeslot, indicating to the localisation modules awaiting assignment that timeslot TS2 is still free. The localisation modules perform a new random selection; step E2 a: there is no conflict on timeslot TS3, the assignment request is accepted. The central processing system signals this by interrupting the emission of the secondary activation signal at the end of timeslot TS3. This timeslot is now assigned; step E3: no localisation module has selected timeslot TS2. The central processing system signals that it is still available by emitting a secondary activation signal at the end of timeslot TS2;	

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
active pen and a button status of a button on the first active pen.	therewith.” It would be obvious to a POSITA that the data transmitted could include force data. Additionally, “[f]or the same mobile element, it is also possible to change its characteristics by modifying one of these parameters upon user action (a ring, a thumbwheel, or a switch on the pen for example). On the basis of these mechanical interventions, a microcontroller present in the localisation module can modify the associated time delay value or transmit data, in particular in the form of a bit stream, indicating that a new function has been selected.” Lefevre ¶0262. Thus, a ring, a thumbwheel, or a switch on the pen could be a button of a pen. Therefore, Lefevre discloses a button as a ring, a thumbwheel, or a switch, and Lefevre discloses the transmission of this data.	“at step 272, the stylus 130 generates a row information signal for communication to the panel (through its capacitive coupling) during the stylus X transmit period 254(3). The row information signal may be modulated to include button and pressure information.” <i>Id.</i> FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre>
Claim 19 19[pre] The method of claim 12, further comprising:	<i>See supra</i> 12[pre] – 12[e].	<i>See supra</i> 12[pre] – 12[e].
19[a] initiating, before initiating the current beacon period, a prior beacon period by broadcasting a	Lefevre discloses that the first timeslot TS0 initiates the previous a periodic pulse of period P1 (corresponding to the prior beacon period) by broadcasting the previous common activation signal (corresponding to the prior beacon). <i>Id.</i> ¶¶0210-0214, 0221-0225. The above process corresponds to	Chandran discloses that “[i]n step 260, the control circuitry 120 causes a wake-up signal to be applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 252. The wake-up signal may take the form of the periodic signal discussed above. The wake-up signal may be

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prior beacon signal;	initiating a prior beacon period by broadcasting a prior beacon. Lefevre further discloses that in the prior beacon period, during the timeslot TS0, the unpaired localisation module transmits a signal (corresponding to the ACK of the prior beacon), and if the central processing system receives a signal from the localisation module at the timeslot TS0, the central processing system emits a secondary activation signal at the end of each unassigned timeslot. In this case, the timeslot TS0 is occupied by the localisation module. Then, after all the timeslots are allocated to corresponding localisation modules, at the beginning of each periodic pulse of period P1, the central processing system sends an activation instruction (corresponding to an uplink packet) to all the localisation modules that transmit signals and occupy corresponding time slots. <i>Id.</i> ¶¶0213-0231.	modulated to carry information if desired. In step 262, the stylus 130 (through its capacitive coupling to the panel) operates in a listen mode and senses change capacitance at the nodes 113 due to the wake-up signal applied by the panel control circuitry 120. From sensing the panel transmitted wake-up signal during the periods 252, the stylus 130 is able to synchronize itself in step 264 to the communications frame 250 and thus know the timing location of the stylus transmit periods 254(1)-254(3).” Chandran at 6:37-6:52. FIG. 7 <pre> graph TD 260[260~ PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[262~ STYLUS LISTENS] 262 --> 264[264~ STYLUS SYNC'S TO THE FRAME] 264 --> 266[266~ STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[268~ STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[270~ PANEL LISTENS ON COLUMNS] 270 --> 272[272~ STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[274~ PANEL LISTENS ON ROWS] 274 --> 276[276~ REPEAT] </pre> Additionally, Chandran discloses that, in situations with multiple styli, “an initialization or configuration (as with a pairing) operation as shown in FIG. 9 is executed where the stylus identification information in the wake-up signal sent in step 360 is shared in common by a class or group of styluses. Any stylus proximate enough to the panel will receive the wake-up signal in step 362. The receiving stylus 130

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
19[b] receiving, during a timeslot of the prior beacon period, an		functions to compare its stylus identification value to the common identification information included in the wake-up signal (step 364). If there is a match or correlation regarding identification, the stylus 130 will synchronize itself in step 366 to the communications frame 250 and generate the responsive sync signal for communication back to the panel confirming synchronization to the panel in step 368. <i>Id.</i> at 7:57-8:48.  <pre> graph TD 360[PANEL GENERATES WAKE-UP SIGNAL WITH COMMON ID] --> 362[STYLUSES LISTEN] 362 --> 364{ID MATCH ?} 364 -- NO --> 374[IGNORE] 364 -- YES --> 366[STYLUSES SYNC TO FRAME] 366 --> 368[STYLUSES GENERATE SYNC RESPONSE SIGNAL WITH UNIQUE ID] 368 --> 370[PANEL LISTENS] 370 --> 372[STORE STYLUSES ID'S] </pre> FIG. 9 These processes of generating a “wake-up signal” correspond to a prior beacon. As discussed above, Chandran discloses that, in response to the wake-up signal, “[i]f there is a match or correlation regarding identification, the stylus 130 will synchronize itself in step 366 to the communications frame 250 and generate

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) signal from the localisation module at the timeslot TS0, the central processing system emits a secondary activation signal at the end of each unassigned timeslot. In this case, the timeslot TS0 is occupied by the localisation module. Then, after all the timeslots are allocated to corresponding localisation modules, at the beginning of each periodic pulse of period P1, the central processing system sends an activation instruction (corresponding to an uplink packet) to all the localisation modules that transmit signals and occupy corresponding time slots. <i>Id.</i> ¶¶0213-0231. Thus, Lefevre discloses that the upstream packet as an activation instruction is generated in response to the acknowledgement, and the upstream packet as an activation instruction further specifies the first timeslot.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”) the responsive sync signal for communication back to the panel confirming synchronization to the panel in step 368. Chandran at 7:35-7:41. A POSITA would understand that the “responsive sync signal” functions as an acknowledgment.  FIG. 9
19[c] wherein the first active pen is unpaired during at least a portion of the prior beacon period,	Lefevre further discloses that “the first timeslot TS0 begins at the moment of emission of an activation “instruction” of the common activation signal. It is specific and reserved for the arrival of new localisation modules”. <i>Id.</i> ¶0212. The new localisation modules correspond to the unpaired localisation modules or the nonactivated localisation modules. Thus, Lefevre discloses that the first active pen is unpaired during a portion of the prior beacon period.	Chandran discloses “in step 266, the stylus 130 generates a sync signal for communication to the panel (through its capacitive coupling) during the stylus sync transmit period 254(1) confirming synchronization to the panel and advising the panel to anticipate subsequent communication from the stylus.” Chandran, at 6:52-6:56. This is in response to the wake-up signal, meaning that the stylus was unpaired at the time it received the wake-up signal initializing the prior beacon period.

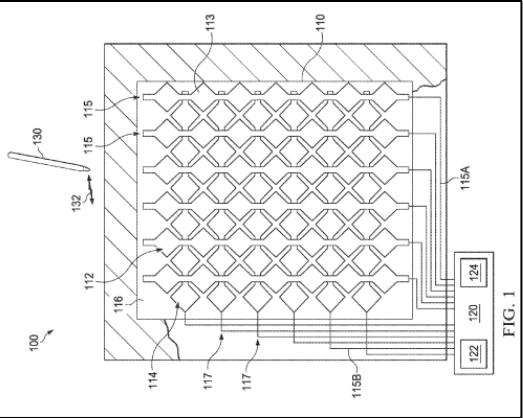
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 7 <pre> graph TD 260[260 PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[262 STYLUS LISTENS] 262 --> 264[264 STYLUS SYNC'S TO THE FRAME] 264 --> 266[266 STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[268 STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[270 PANEL LISTENS ON COLUMNS] 270 --> 272[272 STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[274 PANEL LISTENS ON ROWS] 274 --> 276[276 REPEAT] </pre> Additionally, Chandran discloses that, with multiple pens, “After the initialization or configuration operation of FIG. 9 is completed, the process of FIG. 7 may be executed with the wake-up signals sent in step 260 modulated to include the unique identification information of particular styluses and thus control the conversation between the panel and each stylus. This operation is illustrated in the timing diagram of FIG. 10. The process of step 262 for having the stylus listen for the wake-up signal would further include, like that shown in step 364 of FIG. 9, an operation performed by the stylus to compare its stylus identification value to the unique identification information contained in the wake-up signal. The remaining steps of FIG. 7 would be performed by that stylus only if there was an identification match. In the absence of a match, in either FIG. 7 or FIG. 9, the stylus would ignore (step 374) the wake-up signal.” <i>Id.</i> at 8:13-8:28.

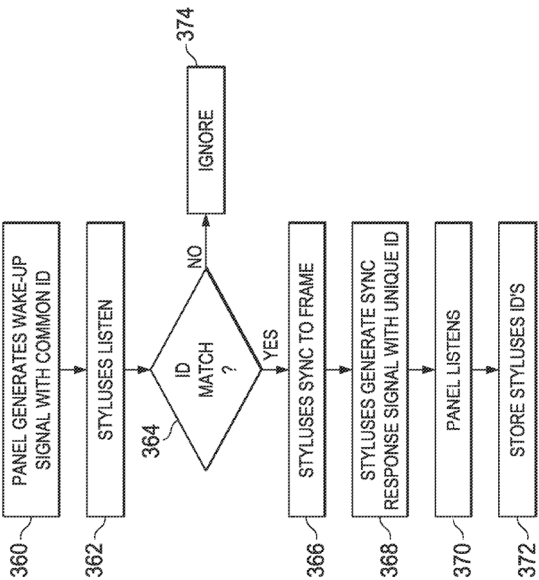
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
19[d] wherein the upstream packet is generated in response to the	<i>See supra</i> 10[e]; Lefevre, at ¶¶0213-0231 (specifying first timeslot (upstream packet) generated in response to acknowledgment).	<pre> graph TD 360[PANEL GENERATES WAKE-UP SIGNAL WITH COMMON ID] --> 362[STYLUSES LISTEN] 362 --> 364{ID MATCH?} 364 -- YES --> 366[STYLUSES SYNC TO FRAME] 366 --> 368[STYLUSES GENERATE SYNC RESPONSE SIGNAL WITH UNIQUE ID] 368 --> 370[PANEL LISTENS] 370 --> 372[STORE STYLUSES ID'S] 364 -- NO --> 374[IGNORE] </pre> FIG. 9 “The responsive signal [from the stylus] is modulated with information providing the unique identification of the responding stylus. The panel listens in step 370 and the control circuitry 120 is provided with the unique identification from the responding styluses. The unique identification of each responding stylus is stored (in step 372) so as to allow the control circuitry 120 to maintain a record of associated styluses and their identification values.” <i>Id.</i> at 8:7-8:12.
19[d] wherein the upstream packet is generated in response to the	<i>See supra</i> 10[e]; Lefevre, at ¶¶0213-0231 (specifying first timeslot (upstream packet) generated in response to acknowledgment).	Chandran discloses Figure 4, “which illustrates a flow diagram for an implementation of the communication protocol useful for the communication mode. A corresponding timing diagram is illustrated in FIG. 5. In step 160, the control circuitry 120 causes a periodic signal to be

Claim Elements U.S. Patent No. 9,977,519 acknowledgment, and	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		applied to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 152. This signal transmission may, for example, comprise a wake-up or polling message, with the active stylus functioning in a sleep mode waiting for receipt of the message. In step 162, the stylus 130 (through its capacitive coupling to the panel) operates in a listen mode (including for example a low power or sleep mode) and senses change in capacitance at the nodes 113 due to the periodic signal applied by the panel control circuitry 120. From sensing the panel transmitted periodic signal during the periods 152, the stylus 130 is activated and functions to synchronize itself in step 164 to the communications frame 150 and thus know the timing location of the stylus transmit periods 154. In step 166, the stylus 130 generates an information signal for communication to the panel (through its capacitive coupling) during the stylus transmit period 154 of the time division multiplexed frame. The panel operates in a listen mode during the stylus transmit period 154 in step 168 and recovers the transmitted information. In step 170, the panel generates an information signal for communication to the stylus 130 during the panel transmit period 152. The stylus 130 (through its capacitive coupling to the panel) operates in a listen mode during the panel transmit period 152 in step 172 and recovers the transmitted information. The steps 166-172 are repeated in accordance with the self-scan frame 150 to support communication from the panel, communication from the stylus or bidirectional communication of information between the panel and stylus.”

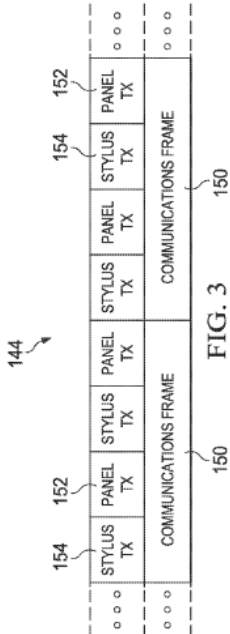
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
19[e] wherein the upstream packet further specifies the first timeslot and the first frequency.		<pre> graph TD 160[160 PANEL GENERATES PERIODIC SIGNAL DURING PANEL TX PERIODS] --> 162[162 STYLUS LISTENS] 162 --> 164[164 STYLUS SYNC'S TO THE FRAME] 164 --> 166[166 STYLUS GENERATES INFORMATION SIGNAL DURING STYLUS TX PERIODS] 166 --> 168[168 PANEL LISTENS] 168 --> 170[170 PANEL GENERATES INFORMATION SIGNAL DURING PANEL TX PERIODS] 170 --> 172[172 STYLUS LISTENS] 172 -.-> 164 </pre> FIG. 4 Thus, in step 170, upstream packet from the input device is generated in response to the acknowledgement. Chandran discloses that, during its designated timeslot, the active pen can transmit information such as button status. For example, in Fig. 7, at “step 268, the stylus 130 generates a column information signal for communication to the panel (through its capacitive coupling) during the stylus Y transmit period 254(2). The column information signal may be modulated to include button and pressure information.” Chandran, at 6:34-7:13. Additionally, “at step 272, the stylus 130 generates a row information signal for communication to the panel (through its capacitive coupling) during the stylus X transmit period 254(3). The row information signal may be modulated to include button and pressure information.” <i>Id.</i>
19[e] wherein the upstream packet further specifies the first timeslot and the first frequency.	Lefevre further discloses that “the analog identification of a localisation module can be performed by sending a dedicated frequency, according to several modes, in particular according to a carrier frequency specific to each localisation module (this frequency identifies the localisation module which is activated)”. And Lefevre further discloses that “since the localisation modules only emit during timeslots assigned to them, the central processing system is able to identify from which localisation module the received data originate”. Lefevre ¶¶0147, 0240.	

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre>
Claim 20 (Ind. Claim) 20[pre] An active pen, comprising:	Lefevre is directed to “a method and devices for interfacing a plurality of mobile elements with a computer system”. Lefevre, at ¶0001. Particularly, as shown in Figure 1, Lefevre’s board 105 interfaces with a computer system, and the board 105 includes a hardware module 130 (or central processing system) to detect the mobile elements 110 arranged on the board 105. <i>Id.</i> ¶¶0001, 0056-0057, Fig. 1. Lefevre further provides an example of the mobile element 110, which can be considered as a pen. <i>Id.</i> ¶0262. Thus, Lefevre discloses a pen as “a mobile element 110”. Moreover, Lefevre discloses that the mobile element 110 comprises a battery, which can supply electric power to the mobile element 110. <i>Id.</i> ¶¶0129, 0035. That means the mobile element 110 can be considered as an active device.	Chandran discloses an active pen in the form of an active stylus. <i>See, e.g.,</i> Chandran, at 1:08 (“The present disclosure generally relates to a system including a capacitive touchscreen panel and a stylus and, more particularly, to the communication of information between the capacitive touchscreen panel and stylus.”); <i>id.</i> at 4:51 (“A second mode available during the self-capacitance scan period 144 is a communication mode used to communicate to and/or from the active stylus 130.”); <i>see also id.</i> at Fig. 1:

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) Therefore, Lefevre discloses an active pen as “a mobile element 110”.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
20(a) an identification (ID) register storing a pen identification (ID);	Lefevre discloses that a mobile element comprises at least one localisation module, and “the central processing unit 255 transmits to the radio emitter 260 an identifier of a localisation module to be activated. This identifier is encoded and then transmitted in the form of a digital or analog radio signal. Each localisation module receiving this signal can then compare the identifier received with its own identifier and activate itself if the identifiers are identical”. Lefevre, at ¶¶0027, 0071. Because its own identifier of the localisation module is stored, a POSITA would have understood or found obvious that the localisation module of the mobile element 110 inevitably comprises a memory. Therefore, Lefevre discloses an identification (ID) register, as a memory in the localisation module of the mobile element 110, storing a pen identification (ID) as an identifier of the localisation module.	 Chandran discloses the use of multiple styli where, during pairing, stylus identification information is shared with the styli upon wake-up (pairing). <i>See</i> Chandran, at 7:57-8:12. “The receiving stylus 130 functions to compare its stylus identification value to the common identification information included in the wake-up signal (step 364). If there is a match or correlation regarding identification, the stylus 130 will synchronize itself in step 366 to the communications frame 250 and generate the responsive sync signal for communication back to the panel confirming synchronization to the panel in step 368.” <i>Id.</i> Because the stylus is comparing the identification received during the wake-up signal with its own stylus identification value, a POSITA would understand that the stylus necessarily has an identification register where its identification is stored. <i>See also id.</i> at Fig. 9:

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		 FIG. 9
20 b a button; and	Lefevre discloses that “[f]or the same mobile element, it is also possible to change its characteristics by modifying one of these parameters upon user action (a ring, a thumbwheel, or a switch on the pen for example)”. Lefevre, at ¶0262. To a POSITA, a ring, a thumbwheel, or a switch on the pen could be a button of a pen.	Chandran discloses that the stylus “generates a column information signal for communication to the panel.” Chandran, at 6:61-6:62. “The column information signal may be modulated to include button and pressure information.” <i>Id.</i> at 6:64-6:65. Chandran also discloses that the stylus “generates a row information signal for communication to the panel.” <i>Id.</i> at 7:3-7:4. “The row information signal may be modulated to include button and pressure information.” <i>Id.</i> at 7:6-7:7. Because the stylus may transmit button information, it necessarily may have a button.
20 c a transceiver configured to:	Lefevre discloses that the mobile elements (i.e., the active pens) have a localisation module with a “means for emitting a signal making it possible to calculate the position of said localization module,” as well as a “means for receiving an	Chandran discloses that it is “possible for the control circuitry 120 and the active stylus 130 to engage in a bidirectional communication.” Chandran, at 2:49-60. The control circuitry 120 is a component of the capacitive sensing panel (i.e., a

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) activation signal” from a computer. Lefevre, at ¶¶0010, 0027-0031. Because the localization module of the mobile element can transmit and receive signals, a POSITA would understand that it has a transceiver.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”) touchpad). See <i>id.</i> at Fig. 1; <i>id.</i> at 2:23-2:24. Because the control circuitry of the touchpad and the active stylus engage in bidirectional communication, a POSITA would understand that the active stylus has a transceiver. Chandran also discloses “an embodiment of an operating protocol for the communication mode.” <i>Id.</i> at 4:53-5:8. The operating protocol disclosed “comprises a time division multiplexed operation in accordance with a repeating communications frame 150, wherein each frame 150 includes at least one panel transmit period 152 and at least one stylus transmit period 154.” <i>Id.</i> “During the panel transmit period 152, the control circuitry 120 drives a signal possibly modulated by information (data) on the interconnected nodes 113 of the columns 115 and/or rows 117 of the capacitive sensing panel. The active stylus 130 is capacitively coupled to the panel and operable to sense the panel transmit signal and recover any information contained in that signal. Conversely, during the stylus transmit period 154, the stylus 130 generates a signal possibly modulated by information (data) and capacitively coupled to the rows and columns of the panel. The control circuitry 120 of the panel functions to sense the capacitive change on nodes 113 and recover any information sent by the stylus 130. It will be understood that the illustration of two panel transmit periods 152 interleaved with two stylus transmit periods 154 in one frame 150 is exemplary only of a basic communications protocol.” <i>Id.</i> This exemplifies the bidirectional communication.
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Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
20[d] receive, from a first input device, a current beacon signal comprising an upstream packet specifying the pen ID, a timeslot, and a frequency,	Lefevre discloses that “the activation of all the localisation modules is initiated by a central processing system (control module for position detection and capture) with a common activation signal, each localisation module independently determining its activation as a function of the common activation signal.” Lefevre, at ¶0192. Lefevre further explains that “said activation signal is a common activation signal for common control of the activation of a plurality of localisation modules.” <i>Id.</i> ¶0017. Thus, transmitting, by a central processing system (control module for position detection and capture), a common activation signal to all the localisation modules of a plurality of mobile elements 110, corresponds to broadcasting a current beacon signal to a plurality of active pens comprising a first active pen. Lefevre discloses that a current beacon signal as “a common activation signal, denoted sync” and an upstream packet included in a current beacon signal as “an activation instruction included in a common activation signal, denoted sync.” <i>Id.</i> ¶0194. Lefevre further discloses the upstream packet contains the index <i>i</i> or the identification code, specifying a corresponding index <i>i</i> or an identification code associated with a mobile element, which a POSITA would understand to be specifying a pen ID associated with the active pen. <i>See id.</i> ¶¶0165-0166.	 FIG. 3
from a first input device, a current beacon signal comprising an upstream packet specifying the pen ID, a timeslot, and a frequency,	Lefevre discloses that “the activation of all the localisation modules is initiated by a central processing system (control module for position detection and capture) with a common activation signal, each localisation module independently determining its activation as a function of the common activation signal.” Lefevre, at ¶0192. Lefevre further explains that “said activation signal is a common activation signal for common control of the activation of a plurality of localisation modules.” <i>Id.</i> ¶0017. Thus, transmitting, by a central processing system (control module for position detection and capture), a common activation signal to all the localisation modules of a plurality of mobile elements 110, corresponds to broadcasting a current beacon signal to a plurality of active pens comprising a first active pen. Lefevre discloses that a current beacon signal as “a common activation signal, denoted sync” and an upstream packet included in a current beacon signal as “an activation instruction included in a common activation signal, denoted sync.” <i>Id.</i> ¶0194. Lefevre further discloses the upstream packet contains the index <i>i</i> or the identification code, specifying a corresponding index <i>i</i> or an identification code associated with a mobile element, which a POSITA would understand to be specifying a pen ID associated with the active pen. <i>See id.</i> ¶¶0165-0166.	Chandran discloses that the control circuitry of the touchpad “causes a wake-up signal to be applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 252.” Chandran, at 6:37-6:44. “The wake-up signal may be modulated to carry information if desired.” <i>Id.</i>

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	Lefevre discloses that the first timeslot TS0 initiates the previous a periodic pulse of period P1 (corresponding to the prior beacon period) by broadcasting the previous common activation signal (corresponding to the prior beacon). <i>Id.</i> ¶¶0210-0214, 0221-0225. The above process corresponds to initiating a prior beacon period by broadcasting a prior beacon. Lefevre further discloses that “the first timeslot TS0 begins at the moment of emission of an activation “instruction” of the common activation signal. It is specific and reserved for the arrival of new localisation modules”. <i>Id.</i> ¶0212. The new localisation modules correspond to the unpaired localisation modules or the nonactivated localisation modules. Thus, Lefevre discloses that the first active pen is unpaired during a portion of the prior beacon period. Lefevre further discloses that in the prior beacon period, during the timeslot TS0, the unpaired localisation module transmits a signal (corresponding to the ACK of the prior beacon), and if the central processing system receives a signal from the localisation module at the timeslot TS0, the central processing system emits a secondary activation signal at the end of each unassigned timeslot. In this case, the timeslot TS0 is occupied by the localisation module. Then, after all the timeslots are allocated to corresponding localisation modules, at the beginning of each periodic pulse of period P1, the central processing system sends an activation instruction (corresponding to an uplink packet) to all the localisation modules that transmit signals and occupy corresponding time slots. <i>Id.</i> ¶¶0213-0231. Thus, Lefevre discloses that the upstream packet as an activation instruction is generated in response to the	FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre> “In an embodiment, the wake-up signal applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 152 and step 260 may be modulated to include stylus identification information (i.e., the identification of the stylus with whom the panel wishes to communicate). The stylus identification information may comprise an identification that is unique to a particular stylus or instead is more generic and applicable to a class or group of styluses. Any stylus proximate enough to the panel will receive the wake-up signal in step 262. The receiving stylus 130 functions to compare its stylus identification value to the stylus identification information included in the wake-up signal.”

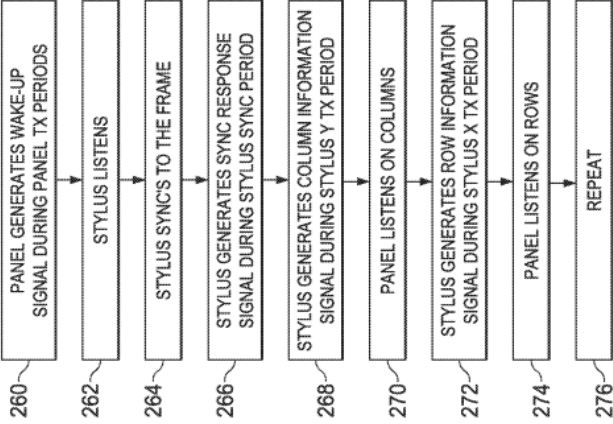
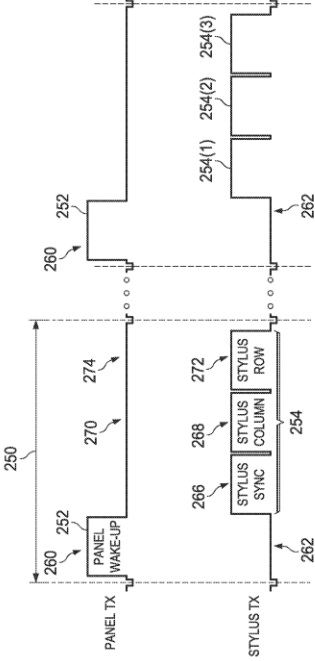
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103) acknowledgement, and the upstream packet as an activation instruction further specifies the first timeslot. Lefevre further discloses that “the analog identification of a localisation module can be performed by sending a dedicated frequency, according to several modes, in particular according to a carrier frequency specific to each localisation module (this frequency identifies the localisation module which is activated)”. And Lefevre further discloses that “since the localisation modules only emit during timeslots assigned to them, the central processing system is able to identify from which localisation module the received data originate”. ¶¶0147, 0240.	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”) <i>Id.</i> at 7:23-7:43. Thus, a POSITA would understand the signal (or beacon) from the panel (or input device) contains a pen ID. FIG. 8 Additionally, Chandran discloses that, with respect to Fig. 4, “[i]n step 160, the control circuitry 120 causes a periodic signal to be applied to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 152. This signal transmission may, for example, comprise a wake-up or polling message, with the active stylus functioning in a sleep mode waiting for receipt of the message. . . . In an embodiment, the periodic signal may comprise a dedicated frequency (carrier) signal that is injected into each column 115 and row 117 of interconnected capacitive-sensing nodes 113 by the control circuitry 120. The periodic signal may, if desired, be modulated with information to be communicated to the stylus from the panel.” <i>Id.</i> at 5:12-5:53. Thus, a POSITA would understand the signal (or beacon) from the panel (or input device) contains a frequency.
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Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
FIG. 4 Additionally, Chandran discloses “a time division multiplexed operation” communication mode for communication to and/or from the active stylus. <i>See id.</i> at 4:51-5:8, Fig. 3: FIG. 3		

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
20 e wherein the current beacon signal initiates a current beacon period comprising a plurality of timeslots; and	Lefevre discloses that “a common activation signal, denoted sync, comprises here periodic pulses, of period P1 and duration P2. The purpose of each pulse of the sync signal, representing an activation “instruction”, is the sequential activation of the localisation modules (all or those previously selected)”. Lefevre, at ¶0194. As shown in Figure 12, each periodic pulse of period P1 includes a common activation signal (duration P2) and a plurality of timeslots with a period of P3, corresponding here to the duration of activation of each localisation module (P3 is here defined as $P1=P2+n \times P3$, where n represents the number of localisation modules to be activated during a period P1). <i>Id.</i> ¶0196, Fig. 12.	“From sensing the panel transmitted periodic signal during the periods 152, the stylus 130 is activated and functions to synchronize itself in step 164 to the communications frame 150 and thus know the timing location of the stylus transmit periods 154.” <i>Id.</i> at 5:26-30. “From sensing the panel transmitted wake-up signal during the periods 252, the stylus 130 is able to synchronize itself in step 264 to the communications frame 250 and thus know the timing location of the stylus transmit periods 254(1)-254(3).” <i>Id.</i> at 6:47-52. Thus, the stylus also receives time slot information. Chandran discloses a “communication mode [that] comprises a time division multiplexed operation in accordance with a repeating communications frame 150, wherein each frame 150 includes at least one panel transmit period 152 and at least one stylus transmit period 154.” Chandran, at 4:53-5:8.” During the panel transmit period 152, the control circuitry 120 drives a signal possibly modulated by information (data) on the interconnected nodes 113 of the columns 115 and/or rows 117 of the capacitive sensing panel. The active stylus 130 is capacitively coupled to the panel and operable to sense the panel transmit signal and recover any information contained in that signal. Conversely, during the stylus transmit period 154, the stylus 130 generates a signal possibly modulated by information (data) and capacitively coupled to the rows and columns of the panel. The control circuitry 120 of the panel functions to sense the capacitive change on nodes 113 and recover any information sent by the stylus 130. It will be understood that the illustration of two panel transmit periods 152 interleaved with two stylus transmit periods 154 in one frame 150 is exemplary only of a basic communications protocol.” <i>Id.</i>

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703.433 (“Chandran”)
160 PANEL GENERATES PERIODIC SIGNAL DURING PANEL TX PERIODS 162 STYLUS LISTENS 164 STYLUS SYNC'S TO THE FRAME 166 STYLUS GENERATES INFORMATION SIGNAL DURING STYLUS TX PERIODS 168 PANEL LISTENS 170 PANEL GENERATES INFORMATION SIGNAL DURING PANEL TX PERIODS 172 STYLUS LISTENS FIG. 4 150 PANEL TX 160 152 160 152 168 170 154 166 172 STYLUS TX 162 164 FIG. 5		

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		Additionally, Chandran discloses a “communication protocol useful for bidirectional communication mode.” <i>Id.</i> at 6:34-7:13. “In step 260, the control circuitry 120 causes a wake-up signal to be applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 252. . . . The wake-up signal may be modulated to carry information if desired.” <i>Id.</i> “In step 262, the stylus 130 (through its capacitive coupling to the panel) operates in a listen mode and senses change capacitance at the nodes 113 due to the wake-up signal applied by the panel control circuitry 120. From sensing the panel transmitted wake-up signal during the periods 252, the stylus 130 is able to synchronize itself in step 264 to the communications frame 250 and thus know the timing location of the stylus transmit periods 254(1)-254(3).” <i>Id.</i>

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 7  FIG. 8  Thus, Chandran discloses a current beacon signal (the wake-up signal) which initiates a current beacon period comprising

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
20[f] transmit, to the first input device and during the timeslot specified in the upstream packet, a downstream packet comprising a status of the button using the frequency specified in the upstream packet.	Lefevre discloses that, during its designated timeslot, the active pen can transmit information such as button status. <i>See, e.g.,</i> Lefevre at ¶¶0261-0262 (“In addition, specific characteristics (colour, eraser or line thickness function for a mobile element representing a pencil) can be associated with the different mobile elements. They can be transmitted by the localisation modules (directly or as a function of associated time delay values), as described above. The selection of a function or colour can be displayed on the object comprising the localisation module in question by dedicated Light-Emitting Diode (LED) display, for example. For the same mobile element, it is also possible to change its characteristics by modifying one of these parameters upon user action (a ring, a thumbwheel, or a switch on the pen for example). On the basis of these mechanical interventions, a microcontroller present in the localisation module can modify the associated time delay value or transmit data, in particular in the form of a bit stream, indicating that a new function has been selected.”).	a plurality of timeslots (the communications frame with panel TX and stylus TX slots). Chandran discloses that, during its designated timeslot, the active pen can transmit information such as button status. For example, in Fig. 7, at “step 268, the stylus 130 generates a column information signal for communication to the panel (through its capacitive coupling) during the stylus Y transmit period 254(2). The column information signal may be modulated to include button and pressure information.” Chandran, at 6:34-7:13. Additionally, “at step 272, the stylus 130 generates a row information signal for communication to the panel (through its capacitive coupling) during the stylus X transmit period 254(3). The row information signal may be modulated to include button and pressure information.” <i>Id.</i>
		FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre>

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
Claim 21 21[pre] The active pen of claim 20, wherein the transceiver is further configured to:	<i>See supra</i> regarding 20[pre] and 20[c].	<i>See supra</i> regarding 20[pre] and 20[c].
21[a] receive, before receiving the current beacon signal, a prior beacon from the first input device,	Lefevre discloses “a dynamic system of activation of the localisation modules.” Lefevre, at ¶0209, Fig. 14. “Such a system can, in particular, be based on a time-division multiple access algorithm (the technique of time-division multiple access is, in particular, operated by second-generation mobile telephone networks such as Global System for Mobile communications (GSM) and variants according to which the number of timeslots can be dynamically reserved exist in standards such as the Bluetooth standard, Bluetooth is a trademark).” <i>Id.</i> ¶0209. Lefevre discloses that the first timeslot TS0 initiates the previous a periodic pulse of period P1 (corresponding to the prior beacon period) by broadcasting the previous common activation signal (corresponding to the prior beacon). Lefevre ¶0210-0214, 0221-0225. This process corresponds to initiating a prior beacon period by broadcasting a prior beacon.	Chandran discloses that “[i]n step 260, the control circuitry 120 causes a wake-up signal to be applied by panel to each column 115 and row 117 of interconnected capacitive-sensing nodes 113 in accordance with the panel transmit periods 252. The wake-up signal may take the form of the periodic signal discussed above. The wake-up signal may be modulated to carry information if desired. In step 262, the stylus 130 (through its capacitive coupling to the panel) operates in a listen mode and senses change capacitance at the nodes 113 due to the wake-up signal applied by the panel control circuitry 120. From sensing the panel transmitted wake-up signal during the periods 252, the stylus 130 is able to synchronize itself in step 264 to the communications frame 250 and thus know the timing location of the stylus transmit periods 254(1)-254(3).” Chandran at 6:37-6:52.

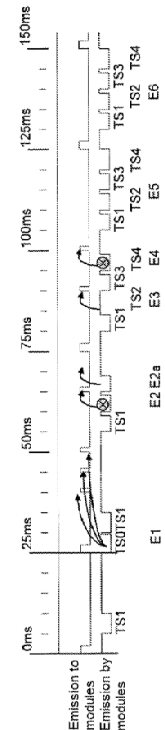


Fig. 14

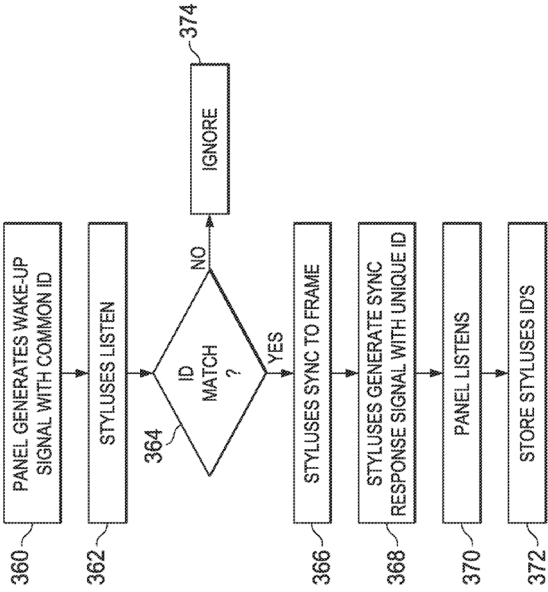
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre> Additionally, Chandran discloses that, in situations with multiple styli, “an initialization or configuration (as with a pairing) operation as shown in FIG. 9 is executed where the stylus identification information in the wake-up signal sent in step 360 is shared in common by a class or group of styluses. Any stylus proximate enough to the panel will receive the wake-up signal in step 362. The receiving stylus 130 functions to compare its stylus identification value to the common identification information included in the wake-up signal (step 364). If there is a match or correlation regarding identification, the stylus 130 will synchronize itself in step 366 to the communications frame 250 and generate the responsive sync signal for communication back to the panel confirming synchronization to the panel in step 368. <i>Id.</i> at 7:57-8:48.

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
21[b] wherein the prior beacon signal initiates a prior beacon period, and	Lefevre discloses the first timeslot TS0 initiates a periodic pulse of period P1 (corresponding to the prior beacon period) by broadcasting the previous common activation signal (corresponding to the prior beacon). Lefevre, at ¶¶0210-0214, 0221-0225. The above process corresponds to initiating a prior beacon period by broadcasting a prior beacon.	<pre> graph TD 360[PANEL GENERATES WAKE-UP SIGNAL WITH COMMON ID] --> 362[STYLUSES LISTEN] 362 --> 364{ID MATCH?} 364 -- YES --> 366[STYLUSES SYNC TO FRAME] 366 --> 368[STYLUSES GENERATE SYNC RESPONSE SIGNAL WITH UNIQUE ID] 368 --> 370[PANEL LISTENS] 370 --> 372[STORE STYLUSES ID'S] 364 -- NO --> 374[IGNORE] </pre> FIG. 9 These processes of generating a “wake-up signal” correspond to a prior beacon. Chandran discloses that in step 260, the control circuitry causes a wake-up signal to be applied by panel to the capacitive-sensing nodes in accordance with the panel transmit periods. The wake-up signal may take the form of the periodic signal and may be modulated to carry information if desired. In step 262, the stylus (through its capacitive coupling to the panel) operates in a listen mode and senses change capacitance at the nodes due to the wake-up signal applied by the panel control circuitry. By sensing the transmitted wake-up signal during the periods, the stylus can synchronize itself in step 264 to the communications

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		frame and thus know the timing location of the stylus transmit periods. Chandran, at 6:37-6:52, Fig. 7: FIG. 7 <pre> graph TD 260[PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[STYLUS LISTENS] 262 --> 264[STYLUS SYNC'S TO THE FRAME] 264 --> 266[STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[PANEL LISTENS ON COLUMNS] 270 --> 272[STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[PANEL LISTENS ON ROWS] 274 --> 276[REPEAT] </pre> In situations with multiple styli, “an initialization or configuration (as with a pairing) operation as shown in FIG. 9 is executed where the stylus identification information in the wake-up signal sent in step 360 is shared in common by a class or group of styluses.” <i>Id.</i> 7:57-8:48; Fig. 9:

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
21[c] wherein the active pen is unpaired for at least a portion of the prior beacon period; and		<pre> graph TD 360[PANEL GENERATES WAKE-UP SIGNAL WITH COMMON ID] --> 362[STYLUSES LISTEN] 362 --> 364{ID MATCH ?} 364 -- NO --> 374[IGNORE] 364 -- YES --> 366[STYLUSES SYNC TO FRAME] 366 --> 368[STYLUSES GENERATE SYNC RESPONSE SIGNAL WITH UNIQUE ID] 368 --> 370[PANEL LISTENS] 370 --> 372[STORE STYLUSES ID'S] </pre> FIG. 9 These processes of generating a “wake-up signal” correspond to a prior beacon. Chandran discloses “in step 266, the stylus 130 generates a sync signal for communication to the panel (through its capacitive coupling) during the stylus sync transmit period 254(1) confirming synchronization to the panel and advising the panel to anticipate subsequent communication from the stylus.” Chandran, at 6:52-6:56. This is in response to the wake-up signal, meaning that the stylus was unpaired at the time it received the wake-up signal initializing the prior beacon period.

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
		FIG. 7 <pre> graph TD 260[260 PANEL GENERATES WAKE-UP SIGNAL DURING PANEL TX PERIODS] --> 262[262 STYLUS LISTENS] 262 --> 264[264 STYLUS SYNC'S TO THE FRAME] 264 --> 266[266 STYLUS GENERATES SYNC RESPONSE SIGNAL DURING STYLUS SYNC PERIOD] 266 --> 268[268 STYLUS GENERATES COLUMN INFORMATION SIGNAL DURING STYLUS Y TX PERIOD] 268 --> 270[270 PANEL LISTENS ON COLUMNS] 270 --> 272[272 STYLUS GENERATES ROW INFORMATION SIGNAL DURING STYLUS X TX PERIOD] 272 --> 274[274 PANEL LISTENS ON ROWS] 274 --> 276[276 REPEAT] </pre> Additionally, Chandran discloses that, with multiple pens, “After the initialization or configuration operation of FIG. 9 is completed, the process of FIG. 7 may be executed with the wake-up signals sent in step 260 modulated to include the unique identification information of particular styluses and thus control the conversation between the panel and each stylus. This operation is illustrated in the timing diagram of FIG. 10. The process of step 262 for having the stylus listen for the wake-up signal would further include, like that shown in step 364 of FIG. 9, an operation performed by the stylus to compare its stylus identification value to the unique identification information contained in the wake-up signal. The remaining steps of FIG. 7 would be performed by that stylus only if there was an identification match. In the

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
21[d] send, in response to the prior beacon, an	Lefevre discloses that in the prior beacon period, during the timeslot TS0, the unpaired localisation module transmits a signal (corresponding to the ACK of the prior beacon), and	absence of a match, in either FIG. 7 or FIG. 9, the stylus would ignore (step 374) the wake-up signal.” <i>Id.</i> at 8:13-8:28.  <pre> graph TD 360[PANEL GENERATES WAKE-UP SIGNAL WITH COMMON ID] --> 362[STYLUSES LISTEN] 362 --> 364{ID MATCH ?} 364 -- NO --> 374[IGNORE] 364 -- YES --> 366[STYLUSES SYNC TO FRAME] 366 --> 368[STYLUSES GENERATE SYNC RESPONSE SIGNAL WITH UNIQUE ID] 368 --> 370[PANEL LISTENS] 370 --> 372[STORE STYLUSES ID'S] </pre> FIG. 9 “The responsive signal [from the stylus] is modulated with information providing the unique identification of the responding stylus. The panel listens in step 370 and the control circuitry 120 is provided with the unique identification from the responding styluses. The unique identification of each responding stylus is stored (in step 372) so as to allow the control circuitry 120 to maintain a record of associated styluses and their identification values.” <i>Id.</i> at 8:7-8:12.
21[d] send, in response to the prior beacon, an	Lefevre discloses that in the prior beacon period, during the timeslot TS0, the unpaired localisation module transmits a signal (corresponding to the ACK of the prior beacon), and	Chandran discloses that, in response to the wake-up signal, “[i]f there is a match or correlation regarding identification, the stylus 130 will synchronize itself in step 366 to the

Claim Elements U.S. Patent No. 9,977,519 acknowledgment to trigger pairing with the first input device.	if the central processing system receives a signal from the localisation module at that timeslot, the central processing system emits a secondary activation signal at the end of each unassigned timeslot. Then, after all the timeslots are allocated to corresponding localisation modules, at the beginning of each periodic pulse of period P1, the central processing system sends an activation instruction (corresponding to an uplink packet) to all localisation modules that transmit signals and occupy corresponding time slots. Lefevre ¶¶0213-0231. Thus, Lefevre discloses that the upstream packet as an activation instruction is generated in response to the acknowledgement, and the upstream packet as an activation instruction further specifies the first timeslot.	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703.433 (“Chandran”) communications frame 250 and generate the responsive sync signal for communication back to the panel confirming synchronization to the panel in step 368.” Chandran, at 7:35-7:41. A POSITA would understand that the “responsive sync signal” functions as an acknowledgment.
360 PANEL GENERATES WAKE-UP SIGNAL WITH COMMON ID 362 STYLUSES LISTEN 364 ID MATCH ? 374 IGNORE 366 STYLUSES SYNC TO FRAME 368 STYLUSES GENERATE SYNC RESPONSE SIGNAL WITH UNIQUE ID 370 PANEL LISTENS 372 STORE STYLUSES ID'S FIG. 9			
Claim 22 22[pre] The active pen of claim 21, wherein the transceiver is further configured to:	See <i>supra</i> regarding 20[pre] and 20[c].	See <i>supra</i> regarding 20[pre] and 20[c].	

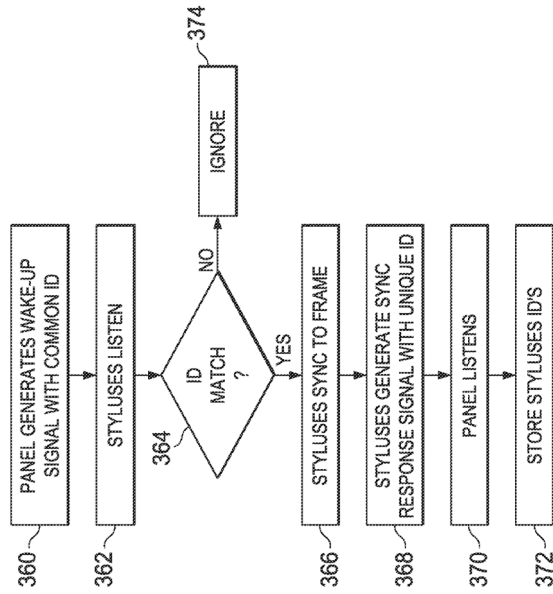
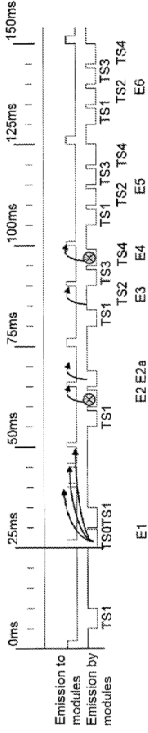


FIG. 9

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
22[a] receive, from the first input device, a collision packet;	Lefevre discloses a system to resolve collisions, including having the active pen receive a collision packet from the first input device. For example, Lefevre discloses that for purposes of order of activation of pens, “it is also possible to use a dynamic system of activation of the localisation modules as described below with reference to FIG. 14. Such a system can, in particular, be based on a time-division multiple access algorithm (the technique of time-division multiple access is, in particular, operated by second-generation mobile telephone networks such as Global System for Mobile communications (GSM) and variants according to which the number of timeslots can be dynamically reserved exist in standards such as the Bluetooth standard, Bluetooth is a trademark).” Lefevre, at ¶0209. “[S]uch dynamic management makes it possible to resolve conflicts between localisation modules which have identical calculated or predefined time delay values.” <i>Id.</i> ¶0210. The system is described in Lefevre at ¶¶0211-0218. “Cases of collisions are resolved for example by algorithms such as those mentioned in the section entitled ‘Collision backoff and retransmission’ in the IEEE 802.3 Ethernet standard.” <i>Id.</i> ¶0219. A POSITA would understand this standard utilizes “collision packets.” <i>See, e.g., Ex. 1016, IEEE Std 802.3, 2000 Edition</i>, at 4 (“The interface between the MAC sublayer and the Physical Layer includes signals for framing (carrier sense, receive data valid, transmit initiation) and contention resolution (collision detect), facilities for passing a pair of serial bit streams (transmit, receive) between the two layers, and a wait function for timing.”); <i>id.</i> at 47 (“In the event of a collision, the transmitting station’s Physical Layer initially notices the interference on the medium and	Chandran discloses a scenario where two or more styluses collide with each other. The control circuitry generates wake up signals again, which a POSITA would consider as sending a collision packet. <i>See</i> Chandran, at 8:29-48 (“The transmission of the wake-up signal in step 360 of 3° FIG. 9 is essentially a point to multi-point broadcast communication. It is possible that multiple styluses will receive the wake-up signal, satisfy the matching test of step 364, and want to generate the sync response signal in step 368. This raises a concern that multiple styluses will simultaneously communicate during a single stylus sync period 266. If such simultaneous communications occur from multiple styluses, there is a possibility of the signals stepping on each other and the control circuitry 120 may not receive stylus sync confirmations and stylus identification information. To avoid this, when the control circuitry 120 detects a first stylus, for example through analyzing the location of the stylus relative to the panel, the control circuitry will lock onto the stylus by scanning only the [columns] and rows of that location. When two styluses are close to each other to a degree prohibiting separation by the control circuitry, the control circuitry will ignore the styluses and generate wake up signals again as in step 360 of FIG. 9.”).

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	then turns on the collision detect signal. In half duplex mode, this is noticed in turn by the Transmit Media Access Management component of the MAC sublayer, and collision handling begins. First, Transmit Media Access Management enforces the collision by transmitting a bit sequence called jam.”). A POSITA would understand, based on their knowledge of the use of “collision packets” and relevant standards, that, once a collision packet is used, an input device would terminate the transmission and schedule another transmission attempt after a randomly selected time interval. See also Lefevre ¶¶0224-0232: Steps E1 to E6 of the timing chart show the allocation of timeslots to localisation modules which appear on the detection surface in question: step E1: new localisation modules (with no allocated timeslot) emit by default on timeslot TS0. In response, the central processing system emits secondary activation signals at the end of the free timeslots (here timeslots TS2, TS3 and TS4). The new localisation modules perform random selections to assign timeslots on the basis of the free timeslots. Two of them select timeslot TS2, a third selects timeslot TS3; step E2: there is a conflict on timeslot TS2. The central processing system signals this by maintaining emission of the secondary activation signal at the end of the timeslot, indicating to the localisation modules awaiting assignment that timeslot TS2 is still free. The localisation modules perform a new random selection;	

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	step E2 a: there is no conflict on timeslot TS3, the assignment request is accepted. The central processing system signals this by interrupting the emission of the secondary activation signal at the end of timeslot TS3. This timeslot is now assigned; step E3: no localisation module has selected timeslot TS2. The central processing system signals that it is still available by emitting a secondary activation signal at the end of timeslot TS2; step E4: there is a collision on timeslot TS4. The secondary activation signal is maintained at the end of this timeslot to indicate that it is not yet assigned; step E5: two unassigned localisation modules have selected timeslots TS2 and TS4. There is no conflict and the assignments are accepted. The central processing system stops emitting secondary activation signals at the end of these timeslots to indicate they are allocated, and, step E6: steady mode, each localisation module has been allocated a timeslot.  Fig. 14	
22[b] wait a random time interval in	Lefevre discloses the use of “Collision backoff and retransmission” in the IEEE 802.3 Ethernet standard” at ¶0219, which a POSITA would understand utilizes	As discussed above, Chandran discloses that, “When two styluses are close to each other to a degree prohibiting separation by the control circuitry, the control circuitry will

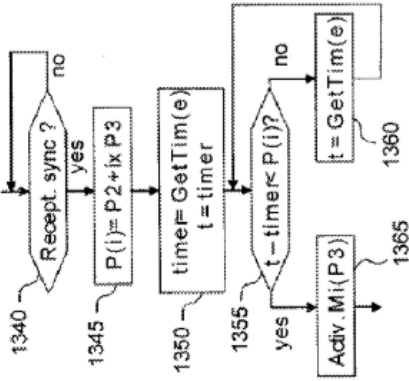
Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
response to the collision packet; and	“collision packets.” <i>See, e.g.,</i> Ex. 1016, IEEE Std 802.3, 2000 Edition, at 4 (“The interface between the MAC sublayer and the Physical Layer includes signals for framing (carrier sense, receive data valid, transmit initiation) and contention resolution (collision detect), facilities for passing a pair of serial bit streams (transmit, receive) between the two layers, and a wait function for timing.”); <i>id.</i> at 47 (“In the event of a collision, the transmitting station’s Physical Layer initially notices the interference on the medium and then turns on the collision detect signal. In half duplex mode, this is noticed in turn by the Transmit Media Access Management component of the MAC sublayer, and collision handling begins. First, Transmit Media Access Management enforces the collision by transmitting a bit sequence called jam.”). A POSITA would understand, based on their knowledge of the use of “collision packets” and relevant standards, that, once a collision packet is used, an input device would terminate the transmission and schedule another transmission attempt after a randomly selected time interval.	ignore the styluses and generate wake up signals again as in step 360 of FIG. 9.” Chandran, at 8:44-48. A POSITA would understand that the wake up signal would be re-sent at a random time interval.
22[c] re-attempt pairing with the first input device after the random time interval.	A POSITA would understand, based on knowledge of the use of “collision packets” and relevant standards, that, once a collision packet is used, an input device would terminate the transmission and schedule another transmission attempt after a randomly selected time interval. Lefevre, at ¶¶0224-0232.	Chandran discloses “when two styluses are close to each other...the control circuitry will ignore the styluses and generate wake up signals again” Chandran, at 8:44-48, Fig. 9. A POSITA would understand that the wake-up signal is re-sent at a random time interval.
Claim 23		
23[pre] The active pen, of claim 21, further comprising:	<i>See supra</i> regarding 20[pre].	<i>See supra</i> regarding 20[pre].

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
23[a] a determination module configured to:	Lefevre discloses a mobile element with a localization module with a “means for emitting a signal making it possible to calculate the position of said localisation module; means for generating an excitation signal of said means for emitting a signal; switching means for controlling the transmission of said excitation signal to said means for emitting a signal, and, means for receiving an activation of said activation signal, activating said switching means to enable the emission of a signal which can be used to calculate the position of said localisation module.” Lefevre, at ¶¶0027-0031. The localisation module comprises a “command reception and detection module 710, which receives and demodulates a signal, for example an HF signal, emitted by an external control module for position detection and capture, in order to determine whether the signal received is intended to activate the localisation module. As described above, such detection can be performed by comparing an identifier received with a previously stored identifier.” <i>Id.</i> ¶¶0124. A POSITA would understand that the localisation module could be a determination module.	Chandran discloses a stylus capable of “compar[ing] its stylus identification value to the stylus identification information included in the wake-up signal.” Chandran, at 7:34-7:35; <i>id.</i> at 7:65-7:67; <i>id.</i> at 8:23-8:25. “If there is a match or correlation regarding identification, the stylus 130 will synchronize itself in step 264 to the communications frame 250 and generate the responsive sync signal for communication back to the panel confirming synchronization to the panel and advising the panel to anticipate subsequent communication from that stylus. Conversely, where there is no match or correlation regarding identification, the stylus ignores the wake-up signal.” <i>Id.</i> at 7:35-7:43. The Chandran stylus’s ability to detect the identification information in the wake-up signal and determine whether there was a match would inform a POSITA that the stylus has a determination module.
23[b] detect a missing beacon from the first input device; and	Lefevre discloses that “each localisation module the position of which has to be obtained executes steps such as those shown in FIG. 13 <i>b</i> .” Lefevre, at ¶0203. Lefevre further discloses: After receiving an activation “instruction” (step 1340), typically a pulse of the sync signal, a time delay value $P(i)$, where i represents a localisation module index (different for each localisation module and comprised between zero and the number of	Chandran discloses that “where there is no match or correlation regarding identification” between the input device’s wake-up signal and the stylus’s identification value, “the stylus ignores the wake-up signal.” Chandran at 7:35-7:43. A POSITA would understand that this could be the detection of a missing beacon from the first input device.

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	localisation modules minus one), is calculated (step 1345) according to the following expression: $P(i)=P2+i \times P3$ P(i) thus represents a duration between the start of the activation “instruction” of the common activation signal and the start of activation of the localisation module having the index i. A value representing the current instant is then obtained, for example using the GetTime() function, and assigned to the variables t and timer (step 1350). Next, the value of the timer variable is subtracted from that of the variable t and the result is compared with the time delay value P(i) previously calculated (step 1355). If the difference between the variables t and timer is not less than the time delay value P(i), a value representing the current instant is obtained again and assigned to the variable t (step 1360) and the algorithm returns to step 1355. On the other hand, if the difference between the variables t and timer is less than the time delay value P(i), the localisation module having the index i is activated during a time interval P3 (step 1365) such that its position can be obtained. While the order of activation of the localisation modules can be predetermined and correspond to indices thereof (or a similar item of data), it is also possible to use a dynamic system of activation of the localisation modules as described below with reference to FIG. 14. Such a system can, in	

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	particular, be based on a time-division multiple access algorithm (the technique of time-division multiple access is, in particular, operated by second-generation mobile telephone networks such as Global System for Mobile communications (GSM) and variants according to which the number of timeslots can be dynamically reserved exist in standards such as the Bluetooth standard, Bluetooth is a trademark). Such an embodiment has the advantage of not requiring predefined positions in the sequence of activation of localisation modules. Moreover, such dynamic management makes it possible to resolve conflicts between localisation modules which have identical calculated or predefined time delay values. According to a particular embodiment, the duration between two activation “instructions” of the common activation signal is divided into a number $n+1$ of timeslots, of a fixed and predetermined duration, referenced TS0 to TSn. A common activation cycle thus contains $n+1$ timeslots. The first timeslot TS0 begins at the moment of emission of an activation “instruction” of the common activation signal. It is specific and reserved for the arrival of new localisation modules. For the duration of timeslot TS0, the localisation modules not yet having a timeslot assigned emit via their solenoid. If the central processing system receives signals from the localisation modules during the period of timeslot TS0, the central processing system emits a secondary activation signal at the end	

Claim Elements U.S. Patent No. 9,977,519	Primary Reference: U.S. Patent Application Publication 2013/0157690 (“Lefevre”) (35 U.S.C. § 103)	Secondary Reference: U.S. Patent No. 9,703,433 (“Chandran”)
	of each unassigned timeslot. This secondary activation signal can, for example, be a specific tone modulating an FM signal. The localisation modules are then informed of all of the free timeslots. Each localisation module performs a random selection to determine a free timeslot during which it will emit during the next cycle. At each cycle and for each free timeslot, there are the following three possibilities: the timeslot remains free: no localisation module has selected it. The central processing system therefore continues to indicate that the timeslot is free by emitting a secondary activation signal at the end of the timeslot; the timeslot has been selected by a single localisation module, which emits during the period of the timeslot: the central processing system then ceases to emit a secondary activation signal at the end of this timeslot. The disappearance of the secondary activation signal informs the localisation module that its timeslot assignment is in effect, and the timeslot has been selected by several localisation modules, which emit during the period of the timeslot: the central processing system detects a collision of signals and continues to indicate that the timeslot is free	

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	by emitting a secondary activation signal at the end of the timeslot. <i>Id.</i> ¶¶0204-0218.  Fig. 13b Lefevre further discloses that “[t]he release of timeslots is managed by the detection of the absence of emission by a localisation module. A time delay is then triggered. If, during the whole of the time delay, the central processing system does not receive an emission from a localisation module, the corresponding timeslot is considered released.” <i>Id.</i> ¶0220. According to the description above, if the central processing system does not receive a transmission from the localisation module, the corresponding time slot is released. The timeslot <i>i</i> is the timeslot corresponding to the localisation module labeled <i>i</i>. Accordingly, for the localisation module	

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	(corresponding to an active pen), if no activation signal (corresponding to a beacon signal) is received from the central processing system (corresponding to the first input device), a POSITA would have understood or found obvious to set a determination module in the localisation module to release the label i as well, so as to release the timeslot occupied by the localisation module, which is allocated by the central processing system.	
23[c] set the ID register to zero in response to the missing beacon to unpair the active pen.	In view of Lefevre as discussed above, a POSITA also would have understood or found obvious that the memory that stores the label i, such as the ID register, is set to 0. So that the label i can be used by other localisation modules. Otherwise, if the central processing system releases the label i and the localisation module (denoted as a localisation module 1) does not release the label i, the central processing system assigns the label i to another localisation module (denoted as a localisation module 2). When the localisation module 1 approaches the central processing system again, both the localisation module 1 and the localisation module 2 will use the label i, which may cause the localisation module 2 to exit the connection with the central processing system and lead to communication interruption.	As discussed above, when the stylus disclosed in Chandran detects that “there is no match or correlation regarding identification” between the input device’s wake-up signal and the stylus’s identification value, “the stylus ignores the wake-up signal.” See <i>supra</i> regarding 23[b]. At that point, the stylus would function “in a sleep mode.” Chandran, at 5:12-5:45. A POSITA may assume that the memory (or “register”) that stores the identification value will also get reset (i.e., the value being “set to zero”) when the stylus ignores the wake-up signal. When the stylus gets activated again, it will listen to a new identification value after which the memory will be overwritten by the newly received identification value. A POSITA may assume that the “pen ID” will also get reset when the pen (i.e., stylus) unpairs.
Claim 24		
24[pre] The active pen of claim 20, wherein the transceiver is further configured to:	See <i>supra</i> regarding 20[pre] – 20[f].	See <i>supra</i> regarding 20[pre] – 20[f].
24[a] receive, from the first input	Lefevre discloses the transfer of data from the input device to the active pen. See, e.g., Lefevre ¶¶0121, 0194, 0237. It	Chandran discloses the transfer of data from the input device to the active pen. See, e.g., Chandran at Figs. 4-5; <i>id.</i> at 5:36-

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device, a user ID of a user;	would be obvious to a POSITA that the information communicated from the host device could include a user ID of a user.	5:38, 5:54-5:57. It would be obvious to a POSITA that the information communicated from the host device could include a user ID of a user.
24[b] send the user ID to a second input device during a pairing of the second input device.	Lefevre discloses that other input devices can be connected to the host device. <i>See, e.g.,</i> Lefevre ¶0054 (“The surface for the detection of the positions is, for example, a PCB (Printed Circuit Board) type card for electromagnetic reception, flexible or rigid. It can be combined with a screen, also flexible or rigid, tactile or not, for example an LCD (Liquid Crystal Display) or OLED (Organic Light-Emitting Diode) type screen, making it possible to move the mobile elements on an interactive visual surface.”); <i>id.</i> ¶0259 (“It is also possible to trigger contextual visual animations under a figure or from a figure. . . . Similarly, it is possible to trigger contextual audio animations when the relative position of two figures permits.”). It would be obvious to a POSITA that the active pen could transmit information, such as the user ID, to these other input devices.	Chandran discloses that other input devices can be connected to the host device. <i>See, e.g.,</i> Chandran at 1:25-1:29. It would be obvious to a POSITA that the active pen could transmit information, such as the user ID, to these other input devices.