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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
18 August 2005 (18.08.2005)

PCT

(10) International Publication Number
WO 2005/074807 A1

(51) International Patent Classification[7]: A61B 8/00

(21) International Application Number:
PCT/IB2005/050406

(22) International Filing Date: 31 January 2005 (31.01.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/542,794 6 February 2004 (06.02.2004) US

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

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM,*

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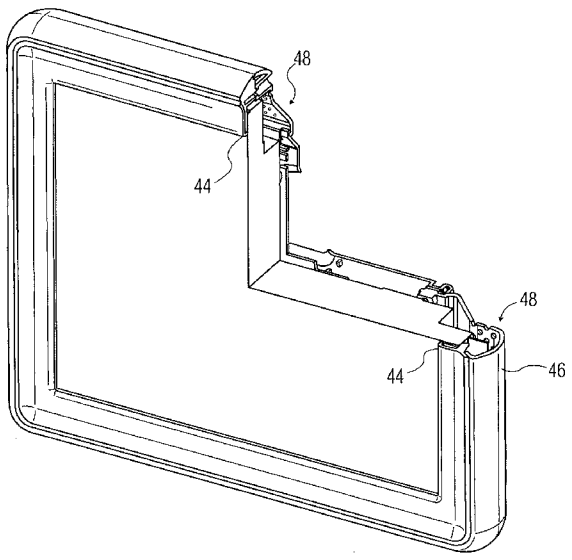
(54) Title: DIAGNOSTIC ULTRASOUND SYSTEM WITH GRIPPABLE ARTICULATING FLAT PANEL DISPLAY



(57) Abstract: An ultrasonic diagnostic imaging system (10) includes an articulating flat panel display (40) for viewing images produced by the ultrasound system. The flat panel display (40) is articulated to a desired viewing position by gripping the periphery of the display screen (42) and moving the display screen (42) to the desired viewing position with one hand. The bezel (44) around the display screen is contoured and formed of a robber-like material which can be engaged with the thumb of a user's hand, and the back of the display enclosure opposing the bezel (44) contains perforations (48) which can engaged with fingers of the user. The gripping perforations (48) also provide ventilation of the flat panel display (40).

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PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

Published:

— *with international search report*

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

DIAGNOSTIC ULTRASOUND SYSTEM WITH GRIPPABLE ARTICULATING FLAT PANEL DISPLAY

This invention relates to medical diagnostic imaging systems and, in particular, to ultrasonic diagnostic imaging systems with flat panel displays that can be gripped by the user to adjust the viewing position.

Ultrasound systems are now being designed to be more ergonomically comfortable for the user to operate. Often, the ultrasound system is wheeled to the patient's bedside for imaging. The sonographer must then be able to hold the probe in contact with the patient while operating the ultrasound system controls and viewing the images produced on the system image display. To enable the sonographer to assume a comfortable position while doing this, one which is primarily focused on the patient, it is desirable for the system controls and display to be movable to a comfortable operating and viewing position. For instance, US pat. 6,669,639 (Miller et al.) describes the ultrasound system shown in FIGURE 1. The display monitor 20 of this system is mounted on a 2-arm articulating mount 30 on the upper surface of the system cart 12, which enables the monitor to be moved from side to side of the ultrasound system cart and to be rotated toward the sonographer or patient for easy viewing. US pat. [application serial number 10/155,459, entitled "DIAGNOSTIC ULTRASOUND SYSTEM CART WITH LATERALLY ARTICULATING CONTROL PANEL,"] describes the ultrasound system shown in FIGURE 2, which uses a flat panel display 16 mounted at a nominal position above the system control panel 18. The control panel 18 of this system can move from one side of the system cart to

the other and can rotate or swivel toward the sonographer for comfortable bedside operation. It would be desirable for the flat panel display 16 to be similarly movable to a comfortable viewing position. An optimal design would enable the display 16 to be positioned over a wide range of lateral viewing positions and heights, and to be easy for the sonographer to reposition with one hand.

In accordance with the principles of the present invention an ultrasound system is described with a flat panel display that articulates to be viewed over a wide range of viewing positions. The articulation is provided by a 2-arm articulation system with a counter-weight assisted 4-bar linkage. The counter-weight assist and the 4-bar linkage require very little effort to reposition the display to a comfortable viewing position. The flat panel display has a peripheral gripping surface which enables the display to be held and repositioned with one hand so that the display can be easily adjusted to be viewable by either the sonographer or the patient.

In the drawings:

FIGURE 1 illustrates a cart-borne ultrasound with an articulating monitor.

FIGURE 2 illustrates a cart-borne ultrasound system with a flat panel display and an articulating control panel.

FIGURE 3 illustrates an articulating flat panel display for an ultrasound system constructed in accordance with the principles of the present invention.

FIGURE 4 are forward and rearward perspective views of an articulating flat panel display of the present invention.

FIGURE 5 illustrates a flat panel display with a

peripheral gripping surface for articulation.

FIGURE 6 is a partially cutaway view of the flat panel display of FIGURE 5, showing the back gripping surface.

FIGURES 7a and 7b are cross-sectional views of the flat panel display of FIGURE 5.

FIGURE 8a, 8b and 8c illustrate an articulating flat panel display of the present invention in the raised, nominal, and stowed positions.

FIGURE 9 illustrates the range of articulation of an articulating flat panel display of the present invention in a vertical plane.

FIGURES 10a, 10b, and 10c illustrate the lateral range of articulation of an articulating flat panel display of the present invention.

FIGURE 11 is an illustration of a number of laterally articulated positions of an articulating flat panel display of the present invention.

FIGURE 12 illustrates a cart-borne ultrasound system of the present invention with a laterally articulating control panel and an articulating flat panel display.

Referring now to FIGURE 3, an articulating flat panel display assembly constructed in accordance with the principles of the present invention is shown. The flat panel display 40 has a viewing screen 42 which is enclosed in an enclosure having a front bezel 44 which surrounds the edges of the display in the front and a rear enclosure section 46. The front bezel 44 and the periphery of the rear enclosure section 46 include gripping surfaces by which a user can grip the flat panel display to adjust its position. The flat panel display 40 is mounted to the ultrasound system by an articulating arm assembly 50. The lower arm or main base 52 has a mounting end

60 which is mounted to the ultrasound system. The main base 52 is pivotally mounted to the ultrasound system to pivot about a vertical pivot axis extending through the mounting end 60. The mounting end 60 encloses a circular mounting bracket with a tooth that rides in a circular slot inside the mounting end 60. The circular slot extends only halfway around the pivot axis of the mounting end and thereby restrains the range of pivoting of the mounting end to 180°. It is desirable to prevent continuous unlimited rotation of the lower arm because the cables to the flat panel display extend through the articulating arms. Continuous rotation of the arms would cause these cables to become twisted and ultimately to be damaged.

The main base 52 of the articulating arm assembly 50 is angled upward at a fixed angle of approximately 25°. This upward angling of the main base 52 provides elevation for the upper arm and flat panel above the upper surface of the ultrasound system. This elevation provides clearance above parts or accessories of the system that may be located above or placed on the upper surface of the system. The elevation also raises the upper arm to a level where it will locate the flat panel display in a nominal, neutrally balanced viewing position when the upper arm is oriented horizontally.

The upper end 62 of the main base 52 mates with the elbow 64 of the upper arm 54. The elbow 64 and upper end 62 are pivotally connected so that the elbow joint will pivot about a second vertical axis. The upper end 62 of the main base includes a pin which rides in a groove in the inner sleeve of the elbow. The pin and groove of this pivoting connection function in the same manner as the tooth

and circular slot of the mounting end 60, allowing the two arms to rotate through a limited arc of the circular 180° groove. The elbow rotation is thus prevented from unlimited rotation which could damage the flat panel cables.

The upper arm 54 includes a 4-bar linkage 70. The four bars 72, 74, 76 and 78 of the linkage 70 are pivotally connected by pivot pins a and b a the forward end of the arm 54 and by pivot pins c and d at the elbow end of the arm. The 4-bar linkage 70 enables the flat panel display to be raised and lowered with respect to the elbow 64. When the upper arm 54 is viewed from the side, the ends of the pivot pins a, b, c, and d will always form a parallelogram as the linkage is articulated up and down. The two upper bars 72 and 74 of the linkage 70 are in this embodiment formed by the two sides of a U-shaped steel plate. The use of the steel plate for the two upper bars provide strength and rigidity between the two bars. The two lower bars 76 and 78 in this embodiment are formed by separate bars which are connected by ribs 82 for strength and rigidity between the lower bars.

Contained within the four bars of the 4-bar linkage 70, in addition to the cabling to the flat panel display, is a pneumatic shock or piston 56. The compressive force of the piston 56 provides a counter-weight to the weight of the flat panel display. The pneumatic piston 56 is pivotally connected to a tilt/swivel base 102 at one end of the upper arm 54, and is also pivotally connected to the elbow 64 at the other end of the upper arm 54. The pivot connection at the elbow 64 is mounted on a threaded shaft vertically positioned in the elbow 64. A hole 66 in the elbow 64 provides access to the hex-

shaped head of the threaded shaft. As the threaded shaft is turned the pivot connection of the pneumatic piston will move up or down in relation to the c and d pivots of the 4-bar linkage. This repositioning of the elbow end of the piston will increase or decrease the tension or stiffness of the force provided by the piston. When the piston force is made stiffer, the user will have to use more force to move the flat panel display down and less force to move the display up. When the piston force is made less stiff, the user will be able to use less force to move the display down and more force to move the display up.

The tilt/swivel base 102 is pivotally connected to a tilt/swivel bracket 104. This connection permits the bracket 104 to rotate about a vertical axis passing through the base 102 and bracket 104, enabling the flat panel display to be turned from side to side without repositioning the articulating arm assembly 50. The tilt/swivel bracket 104 is pivotally mounted to the rear enclosure 46 of the flat panel display by a pivot connection 106 which pivots around a horizontal pivot axis. This pivot axis permits the flat panel display to be tilted to face upward or downward without moving the articulating arm assembly.

Extending downward from the bottom of the upper articulating arm 54 is a catch plate 92. The catch plate 92 will engage a spring-loaded lock plate 94 in the lower arm 52 when the two arms are brought together. The catch plate 92 will contact a spring-loaded ball which is partially visible to the right of the lock plate 94 when the lock is open, which causes the lock plate 94 to spring to the right and retain the catch plate 92. A lock release 96 on the bottom of the lower arm will then move to the locked

position. The two arms will remain locked together until the lock release 96 is moved to the unlock position, which moves the lock plate 94 to the left and releases the engaged catch plate 92. The two arms are locked together to secure the articulating display and prevent articulation when the ultrasound system is being moved or transported.

FIGURE 4a is a perspective view of the articulating flat panel display when the 4-bar linkage upper arm 54 is raised above the horizontal to elevate the display to a higher viewing position. FIGURE 4b is a view of the same positioning of the articulating display from the rear of the flat panel display. As the arrows in FIGURE 4b indicate, the flat panel display can be repositioned horizontally by operation of the vertical axis pivots of the assembly, and the flat panel display can be moved vertically by movement of the bars of the 4-bar linkage 70.

FIGURE 5 shows a front view of a flat panel display embodying a further aspect of the present invention. FIGURE 1 shows the monitor 20 of the system 10 there shown with a handle 100 on the front of the monitor. The monitor can be repositioned by grasping the handle to move the monitor. A flat panel display, lacking the weight of the glass of a display monitor, does not require a repositioning means as robust as a handle. In the embodiment of FIGURE 5 the bezel 44 around the front of the display screen 42 has a surface designed to be gripped by the user's thumb when repositioning the flat panel display. This gripping surface can be provided by forming the front bezel 44 of a silicon or rubber-like material. In a constructed embodiment the gripping surface is formed by coating a bezel formed

of hard plastic with a thermoplastic elastomeric coating such as a Sanopreen overmold or Soft-touch spray coating available from Also Corp. of Vermon, California, USA. FIGURE 6 is a partially cutaway perspective view of the flat panel display 40 which better illustrates the curvature of the bezel 44 which provides a contoured surface that can be gripped firmly with the user's thumb without slipping. Also visible in the cutaway view is the periphery of the rear enclosure section 46 which also contains a gripping surface for the user's fingers. This gripping surface is provided by the texturing of the surface of the periphery of the section 46. In this case the texturing is provided by perforations 48 through the section 46. These perforations not only provide a good gripping surface on the back periphery of the flat panel display, but also provide ventilation of the flat panel enclosure. FIGURE 7a is a cross-sectional view of the flat panel display which shows the contour of the bezel 44 on the front and the perforations 48 around the rear periphery of the display. FIGURE 7b is a simplification of FIGURE 7a which clearly shows the contoured gripping surface 44 on the front of the flat panel display and the perforated gripping surface 48 on the rear enclosure section 46. One skilled in the art will appreciate that texturing other than perforations may be employed, such as grooves, protrusions, or a roughened surface for gripping.

FIGURES 8a-8c illustrate several vertical articulation positions of an embodiment of the present invention. In a constructed embodiment the surface 100 of the ultrasound system on which the articulating flat panel display is mounted is at a height relative to the control panel such that a

nominal display position is provided when the upper arm 54 is horizontally oriented as shown in FIGURE 8b. The threaded adjustment of the piston 56 is set so that the piston force will offset the weight of the upper arm 54 and the flat panel 40 when the upper arm 54 is in this horizontal position. The upper arm 54 can then be raised and lowered from this nominal position as indicated by the arrows in the drawing, with the piston force continuously providing a balancing counter-weight force. This is due to the use of the 4-bar linkage 70 and the pneumatic shock 56 for the upper arm 54. If the 4-bar linkage were located in the lower arm 52, for instance, there would be a greater disparity between the force required to raise the display and the force required to lower the display. By locating the 4-bar linkage and piston in the upper arm 54, these forces can be more uniformly balanced.

FIGURE 8c shows the articulating arm assembly when the flat panel display is stowed for travel. The upper arm 54 is lowered as indicated by the arrow until the catch plate 92 engages the lock plate 94, which causes the lock to engage and retain the two arms in the illustrated stowed position.

FIGURE 9 illustrates the range 110 of locations in a vertical plane which the flat panel display 40 can assume by use of the articulating arm assembly of FIGURE 3. As the arrows indicate the display 40 can move vertically up or down by reason of the articulation of the 4-bar linkage 70 of the upper arm 54. When the articulating arms are pivoted about their vertical pivot axes, the flat panel display can be repositioned from side to side as indicated by the arrows on either side of the display 40.

FIGURES 10a-10c illustrate the lateral

articulation provided by the vertical pivot axes of the embodiment of FIGURE 3. The pivot axis 122 passes through the mounting end 60 of the lower arm 52, the pivot axis 124 passes through the elbow 64 of the articulating arms, and the pivot axis 126 passes through the tilt/swivel base 102 at the back of the flat panel display 40. As explained previously, the pivoting of the lower arm 52 about the axis 122 is constrained to 180° as shown by arrows 152. The pivoting of the upper arm 54 about the axis 124 is also constrained to 180° as shown by the arrows 154. The flat panel display 40 can pivot over the full range about the end of the upper arm 54 as shown by the arrows 156. In FIGURE 10a the lower arm 52 is in its "home" position in which it extends to the rear of the ultrasound system and the upper arm 54 has been pivoted 90o to the right. The flat panel display has been pivoted about axis 126 to face forward. This, and the orientations of the other two drawings on this sheet, show how the flat panel display may be positioned when the sonographer is diagnosing a patient located on the right side of the ultrasound system. In FIGURE 10b the flat panel display has been brought forward and slightly more to the right by pivoting the lower arm 52 about axis 122 and adjusting the flat panel display about axis 126. In FIGURE 10c the flat panel display is moved toward the center of the ultrasound system by movement about all three axes from the position shown in FIGURE 10b.

FIGURE 11 shows an embodiment of the present invention with a wide range of lateral display positions. Shown in bold in the center of FIGURE 11 is a flat panel display 40 and articulating arm assembly 50 with their arms in the nominal home position. The display screen is facing to the front

of the ultrasound system, the lower articulating arm extends toward the rear of the ultrasound system and the upper articulating arm extends from the elbow with the lower arm at the rear to the front of the ultrasound system. Shown in shadow are many of the positions around the mounting point of the articulating arm assembly in which the flat panel display can be located. As the positions at the top of the drawing illustrate, the flat panel display can even be moved to face to the rear of the ultrasound system, should that become desirable.

FIGURE 12 illustrates an embodiment of the present invention in which the ultrasound system has both an articulating flat panel display 40 and an articulating control panel 18, both of which can be repositioned laterally with respect to the main body 12 of the ultrasound system cart. The flat panel display may be articulated as described in any of the articulating arm embodiments described above, or by means of other articulating mechanisms. The control panel 18 may be articulated laterally such as described in US pat. [application serial number 10/155,459], the contents of which are incorporated herein by reference. With the ability to articulate both the flat panel display 40 and the control panel, the sonographer can configure the ultrasound system to scan a patient in the utmost of comfort and convenience.

WHAT IS CLAIMED IS:

1. An ultrasonic diagnostic imaging system including a main body housing imaging electronics and a control panel coupled to the imaging electronics comprising:

an articulating display mount; and

a flat panel display having a viewing screen and electrically coupled to the imaging electronics and coupled to the display mount, the flat panel display including a peripheral region which can be gripped by a user to reposition the flat panel display, the peripheral region including a first gripping surface on the front of the flat panel display forward of the plane of the viewing screen and a second gripping surface rearward of the plane of the viewing screen.

2. The ultrasonic diagnostic imaging system of Claim 1, wherein the first gripping surface is adapted to be engaged by the thumb when repositioning the flat panel display and the second gripping surface is adapted to be engaged by one or more fingers when repositioning the flat panel display.

3. The ultrasonic diagnostic imaging system of Claim 1, wherein the first gripping surface faces to the front of the flat panel display and the second gripping surface faces to the rear of the flat panel display.

4. The ultrasonic diagnostic imaging system of Claim 1, wherein flat panel display further includes a bezel extending about the periphery of the display,

wherein the first gripping surface is located on the bezel and the second gripping surface is located

behind the bezel.

5. The ultrasonic diagnostic imaging system of Claim 1, wherein the first gripping surface is formed of a rubber-like material.

6. The ultrasonic diagnostic imaging system of Claim 1, wherein the first gripping surface is formed of a hard polymer material which is coated with a rubber-like material.

7. The ultrasonic diagnostic imaging system of Claim 6, wherein the rubber-like material comprises an elastomeric coating.

8. The ultrasonic diagnostic imaging system of Claim 6, wherein the hard polymer material further comprises a bezel extending around the periphery of the flat panel display.

9. The ultrasonic diagnostic imaging system of Claim 2, wherein at least one of the gripping surfaces is contoured to be engaged by a user.

10. The ultrasonic diagnostic imaging system of Claim 2, wherein at least one of the gripping surfaces is formed of a pliable material so as to be grippable by a user.

11. The ultrasonic diagnostic imaging system of Claim 2, wherein at least one of the gripping surfaces is textured so as to be grippable by a user.

12. The ultrasonic diagnostic imaging system of Claim 11, wherein the gripping surface which is

textured includes indentations in its surface.

13. The ultrasonic diagnostic imaging system of Claim 12, wherein the indentations comprise perforations through an enclosure which further comprise means for ventilating the flat panel display.

14. The ultrasonic diagnostic imaging system of Claim 11, wherein the gripping surface which is textured includes projections from its surface.

15. The ultrasonic diagnostic imaging system of Claim 1, wherein the peripheral extends around all four sides of the flat panel display.

16. An ultrasonic diagnostic imaging system including a main body housing imaging electronics comprising:

an articulating display mount; and

a flat panel display having a viewing screen and electrically coupled to the imaging electronics and coupled to the display mount, the flat panel display including:

an enclosure enclosing at least the back of the display;

a bezel located on the front of the display about the peripheral region of the viewing screen;

the bezel including a first gripping surface adapted to be engaged by the thumb of a user when repositioning the flat panel display; and

a second gripping surface located on a surface of the enclosure opposite the first gripping surface and adapted to be engaged by the fingers of a user when repositioning the flat panel display.

17. The ultrasonic diagnostic imaging system of Claim 16, wherein the first gripping surface comprises a pliant, rubber-like material.

18. A method for repositioning a flat panel display screen of an ultrasonic diagnostic imaging system comprising:

grasping gripping surfaces on the front and back of the flat panel display on the periphery of the display screen, the front gripping surface being adapted to be engaged by the thumb of a user and the back gripping surface being adapted to be engaged by the fingers of a user; and

repositioning the flat panel display screen to a desired viewing position with one hand.

19. The method of Claim 18, wherein grasping further comprises grasping gripping surfaces located on the top periphery or the bottom periphery of the display screen;

wherein repositioning further comprises adjusting the vertical position of the flat panel display.

20. The method of Claim 18, wherein grasping further comprises grasping gripping surfaces located on the left periphery or the right periphery of the display screen;

wherein repositioning further comprises adjusting the horizontal position of the flat panel display.

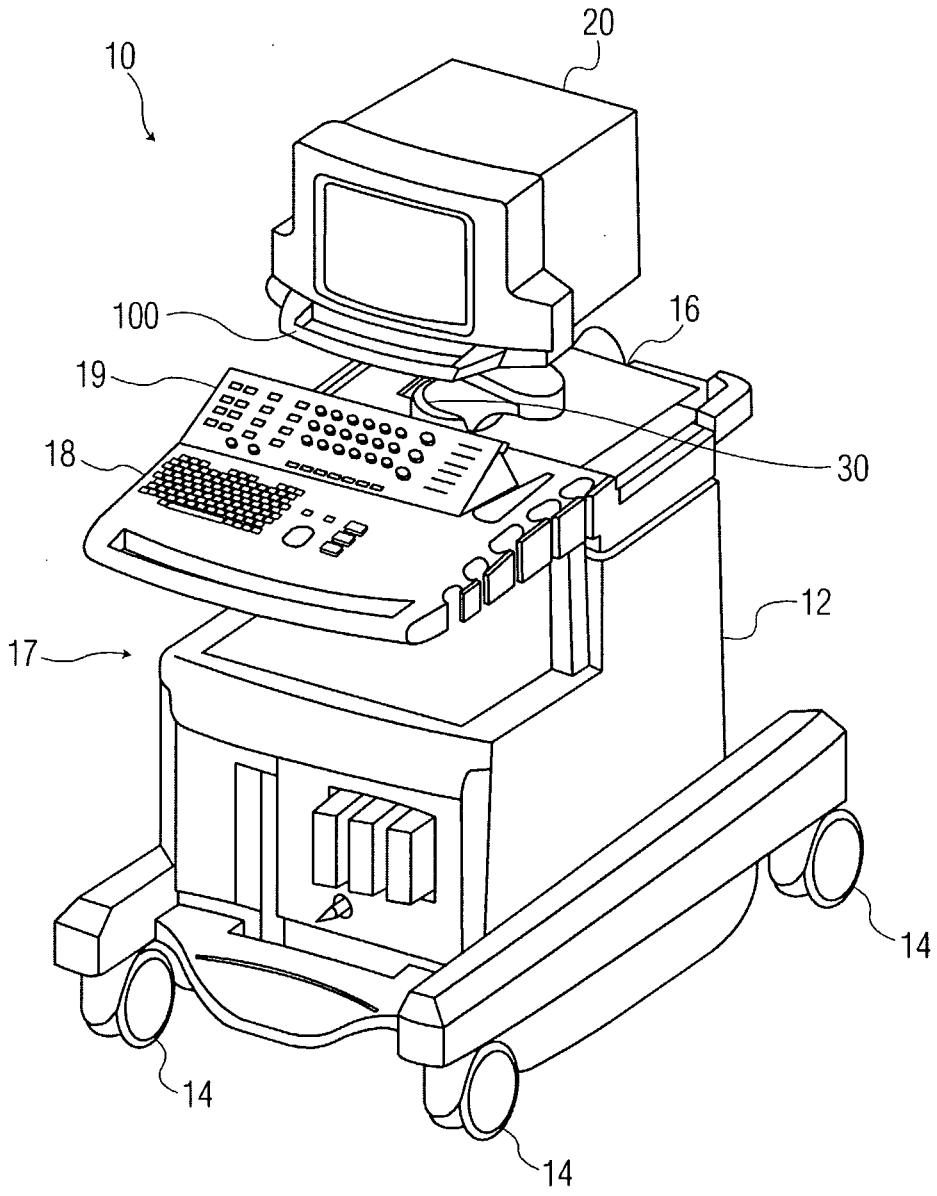

FIG. 1

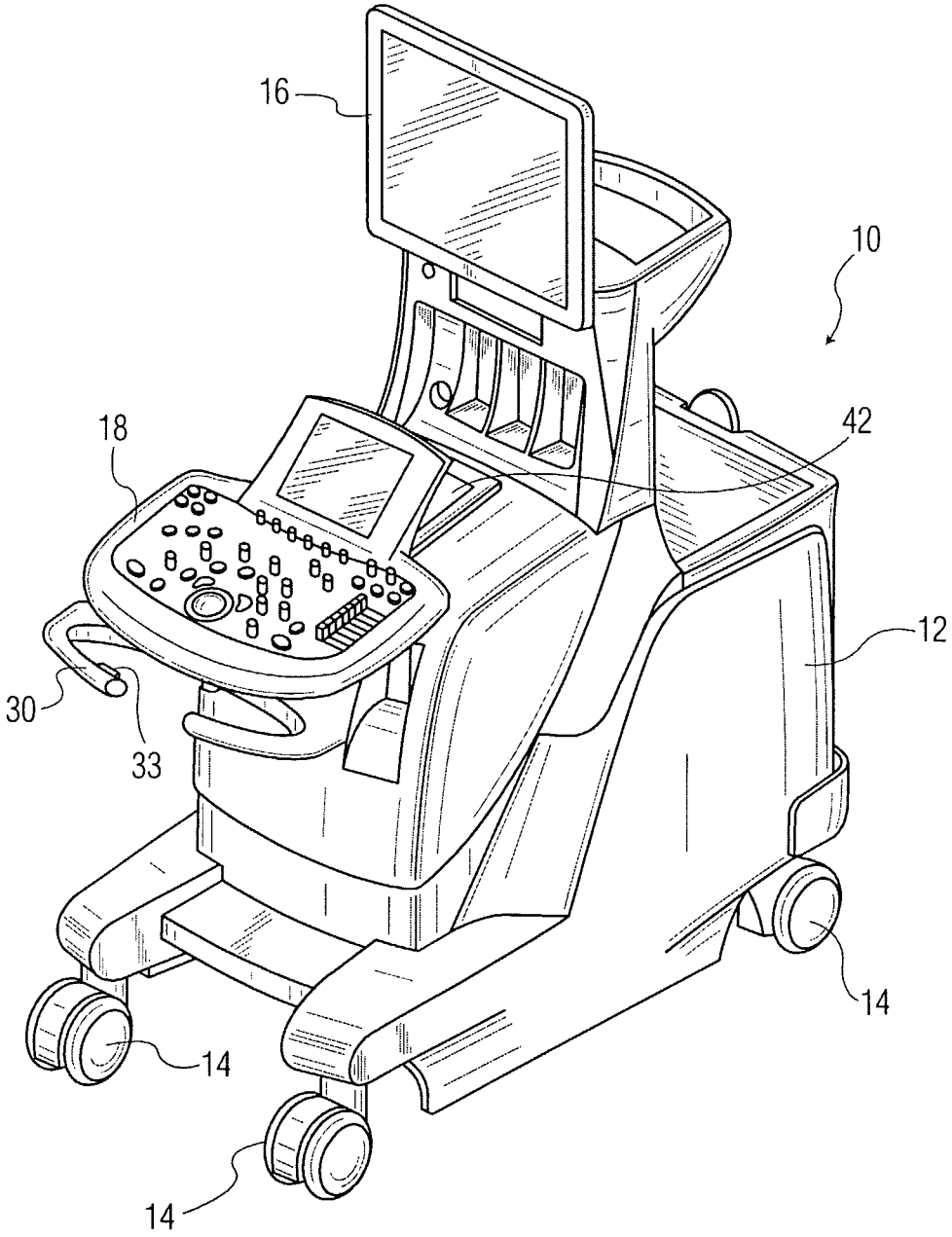

FIG. 2

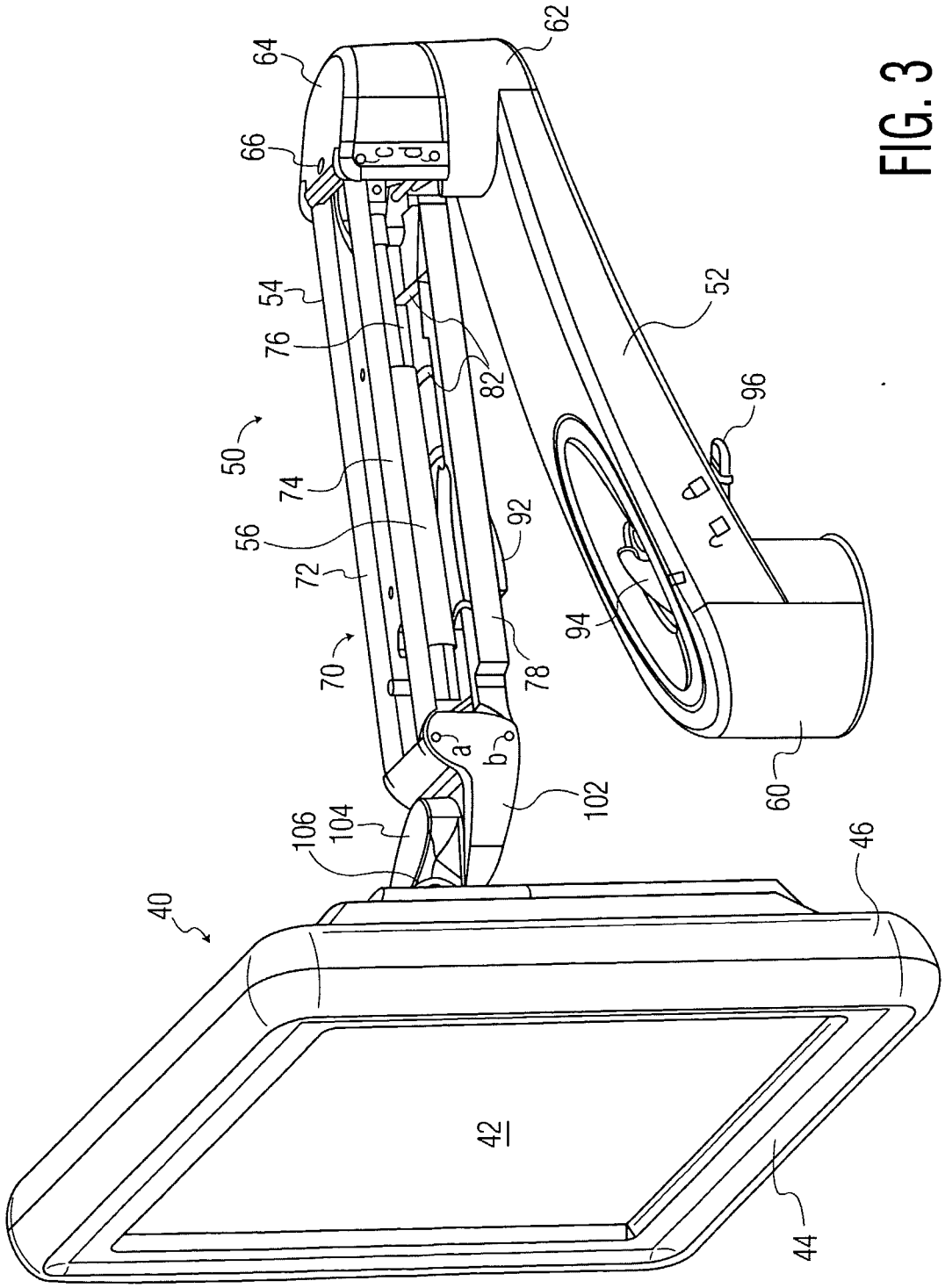
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FIG. 3

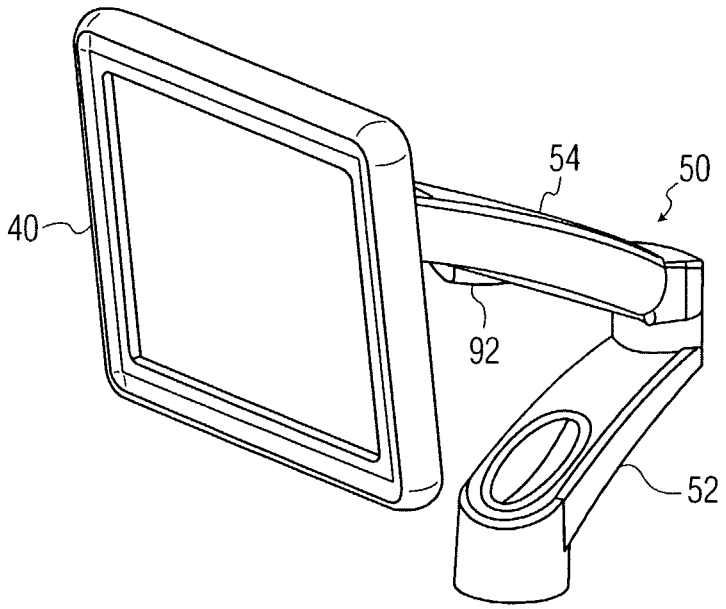


FIG. 4A

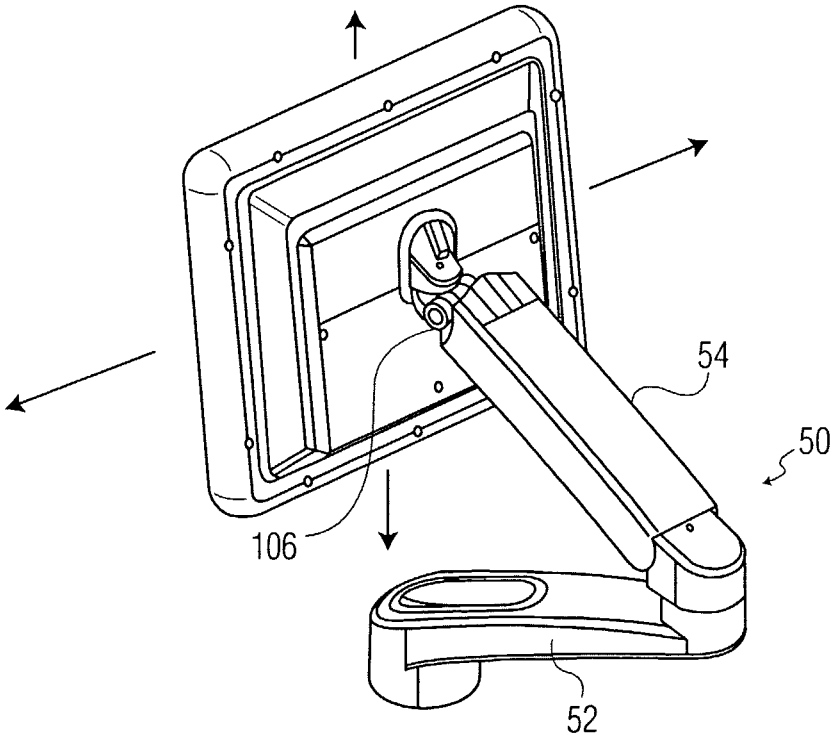
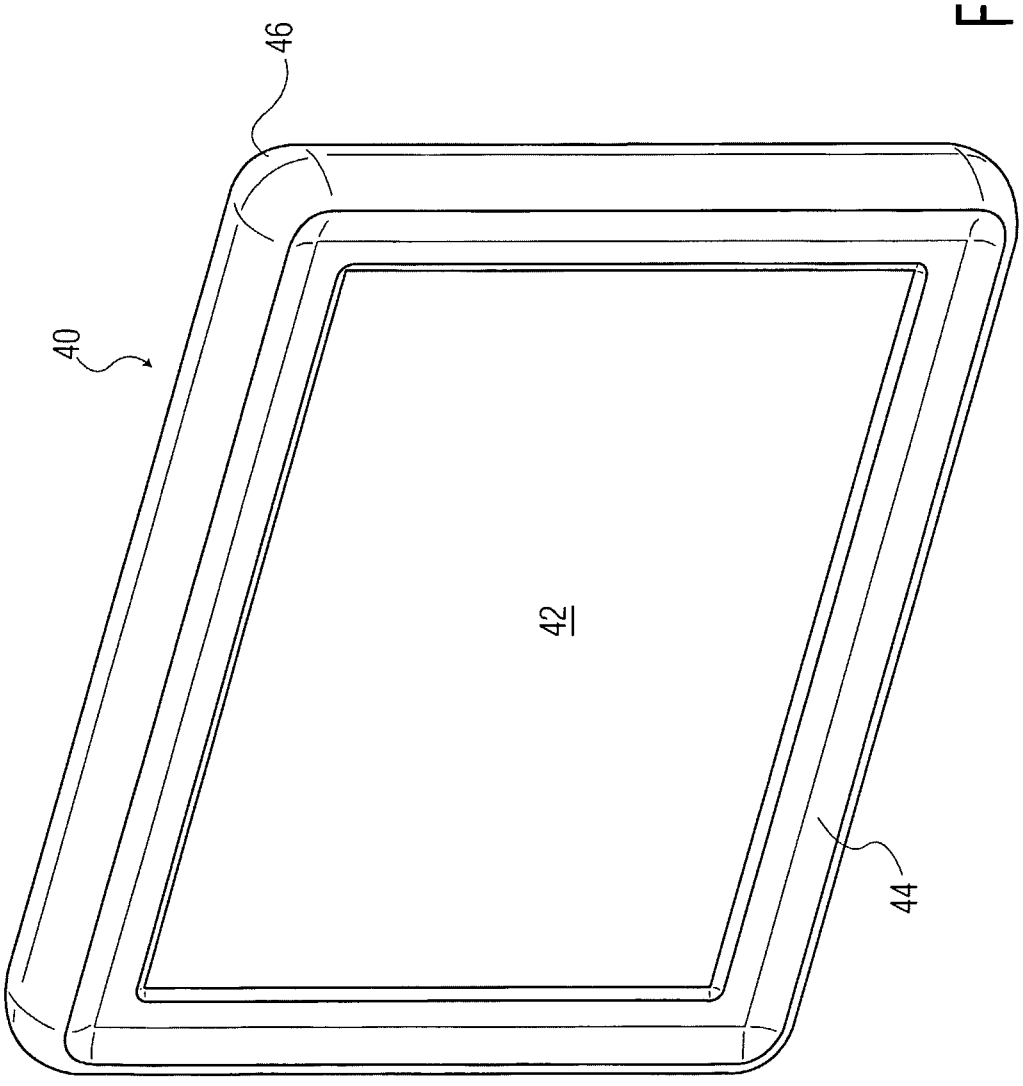


FIG. 4B

FIG. 5



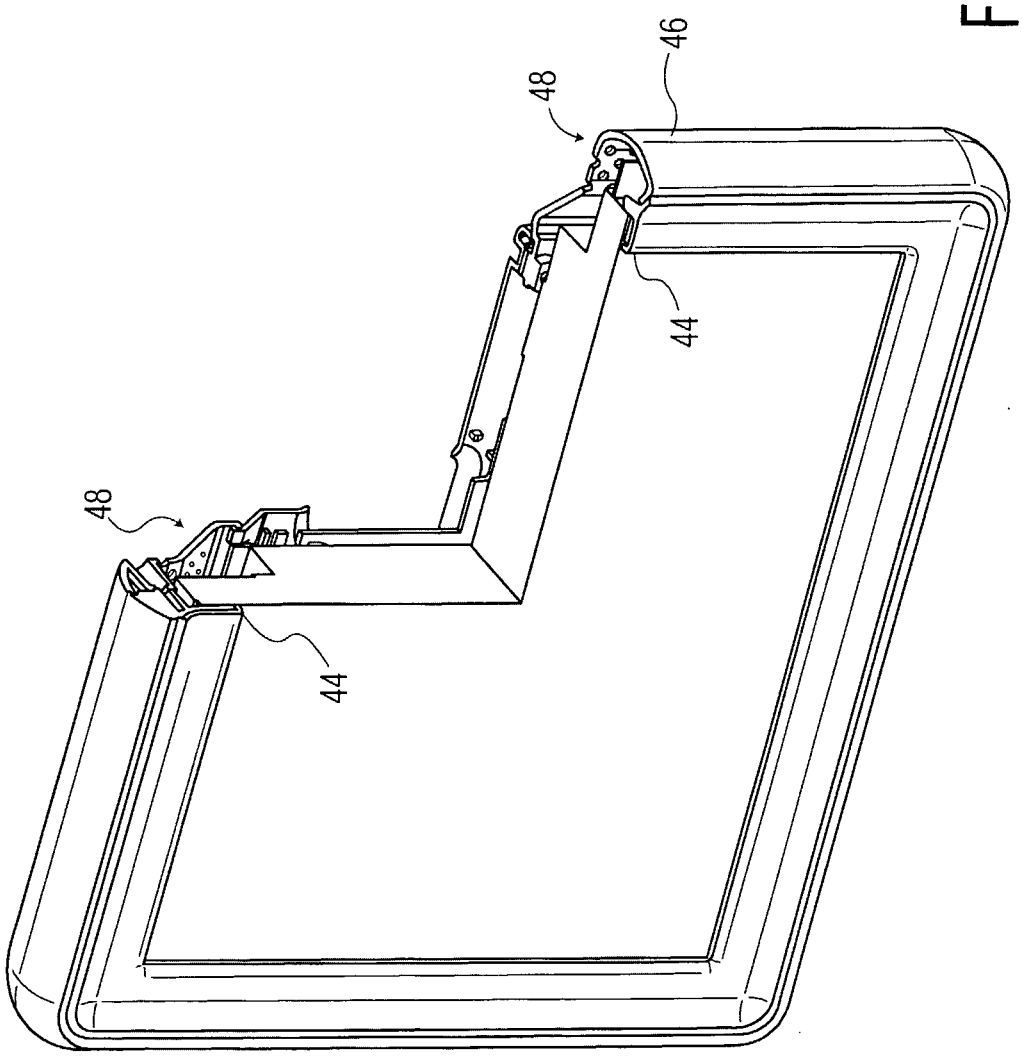


FIG. 6

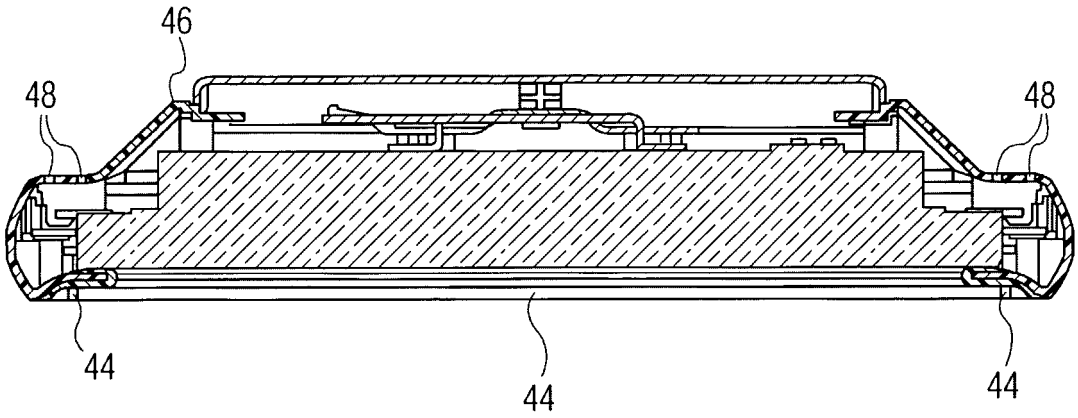


FIG. 7A

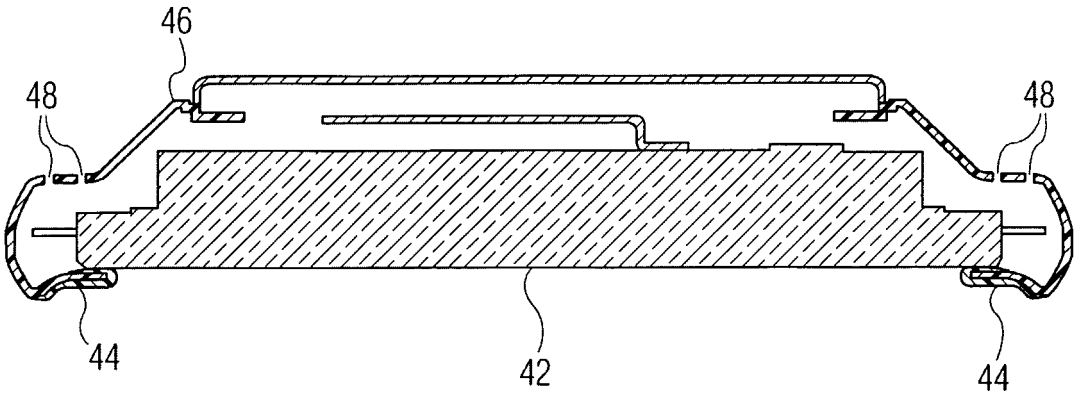


FIG. 7B

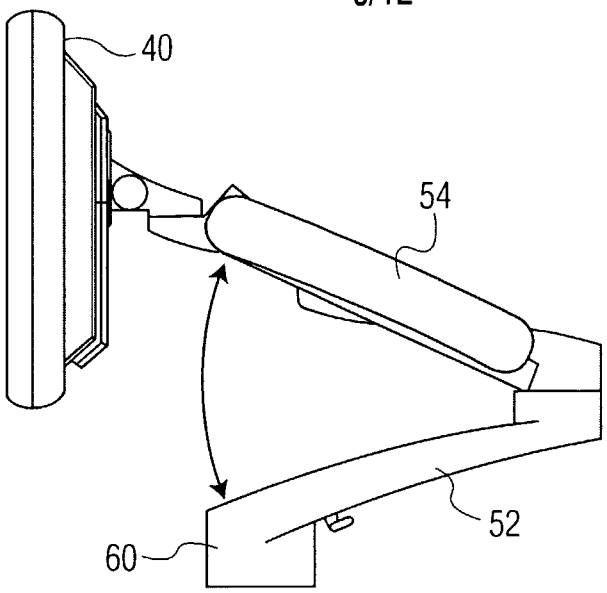


FIG. 8A

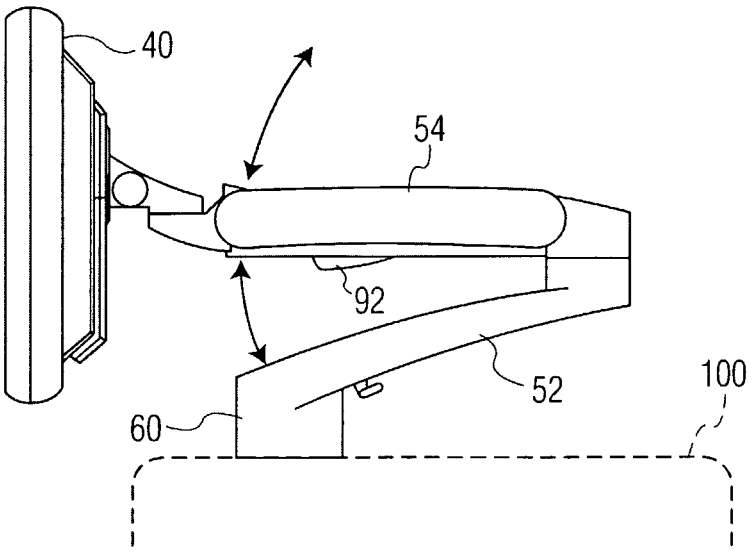


FIG. 8B

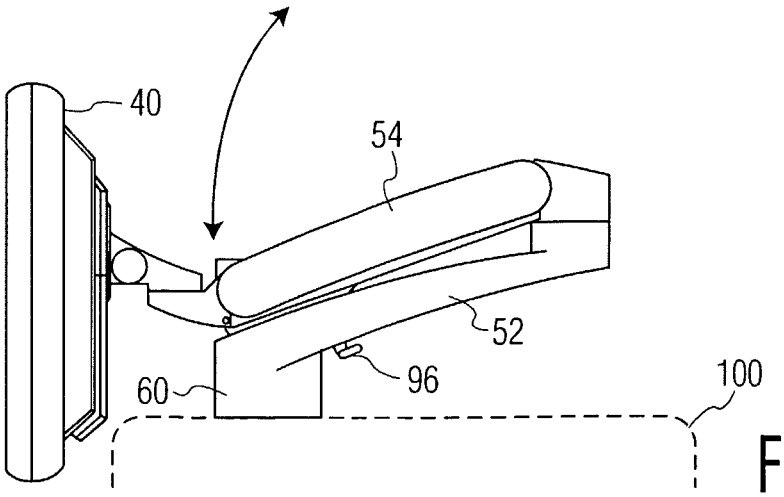


FIG. 8C

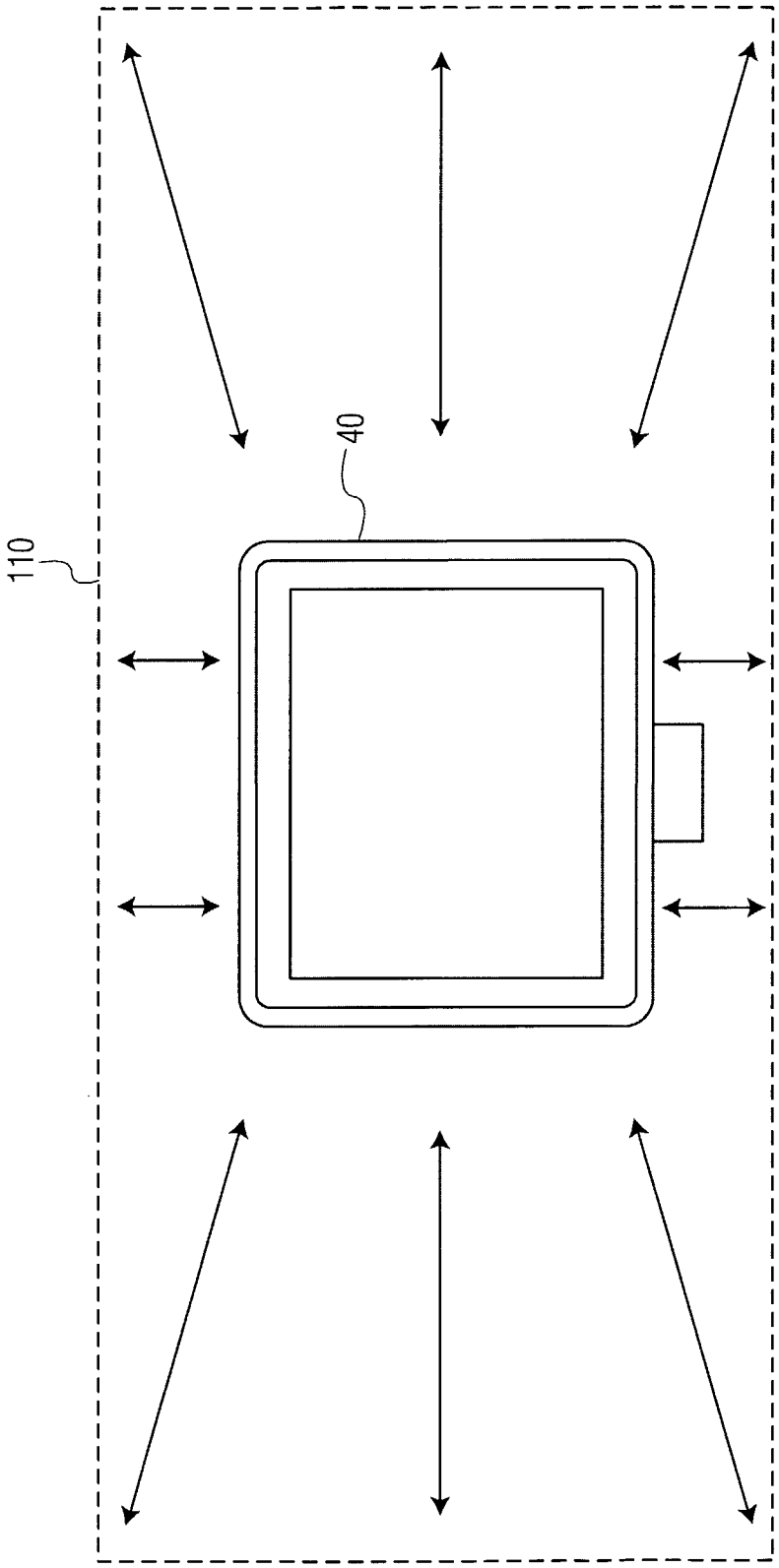


FIG. 9

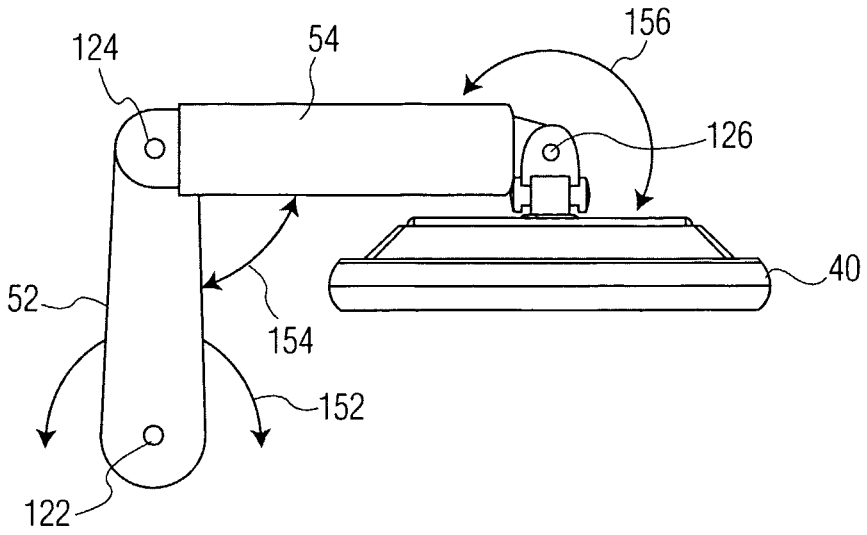


FIG. 10A

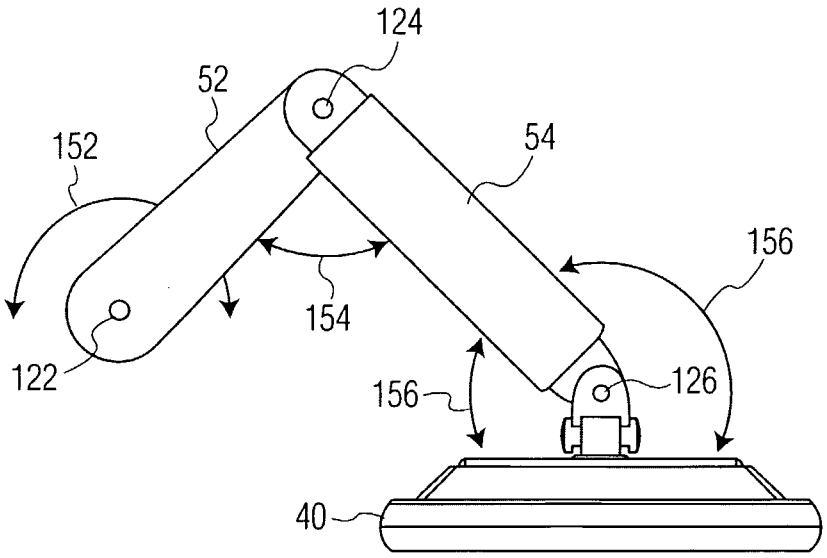


FIG. 10B

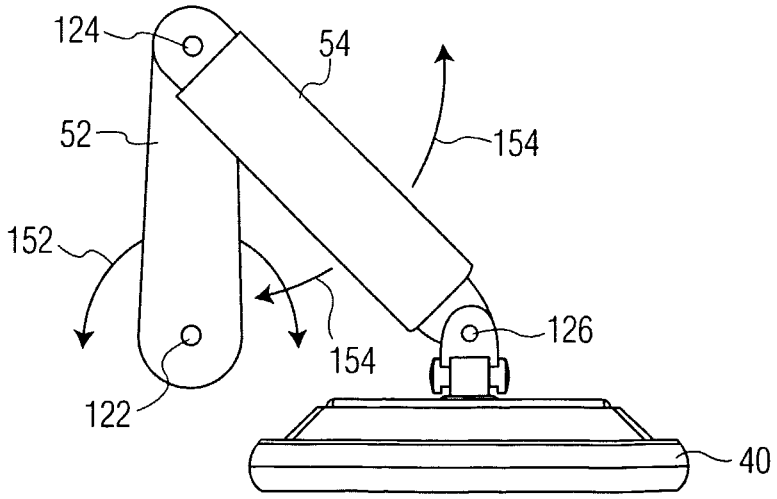


FIG. 10C

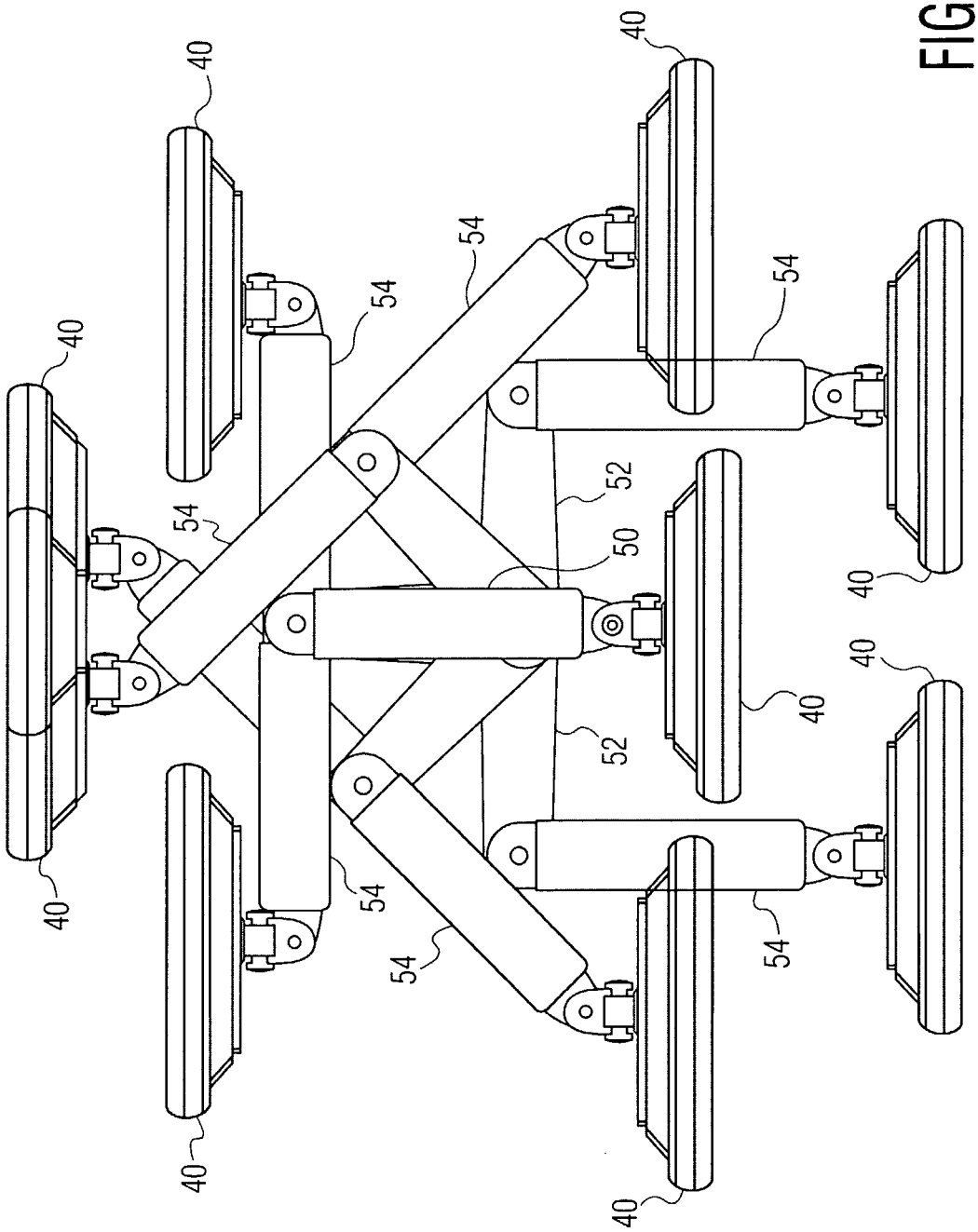


FIG. 11

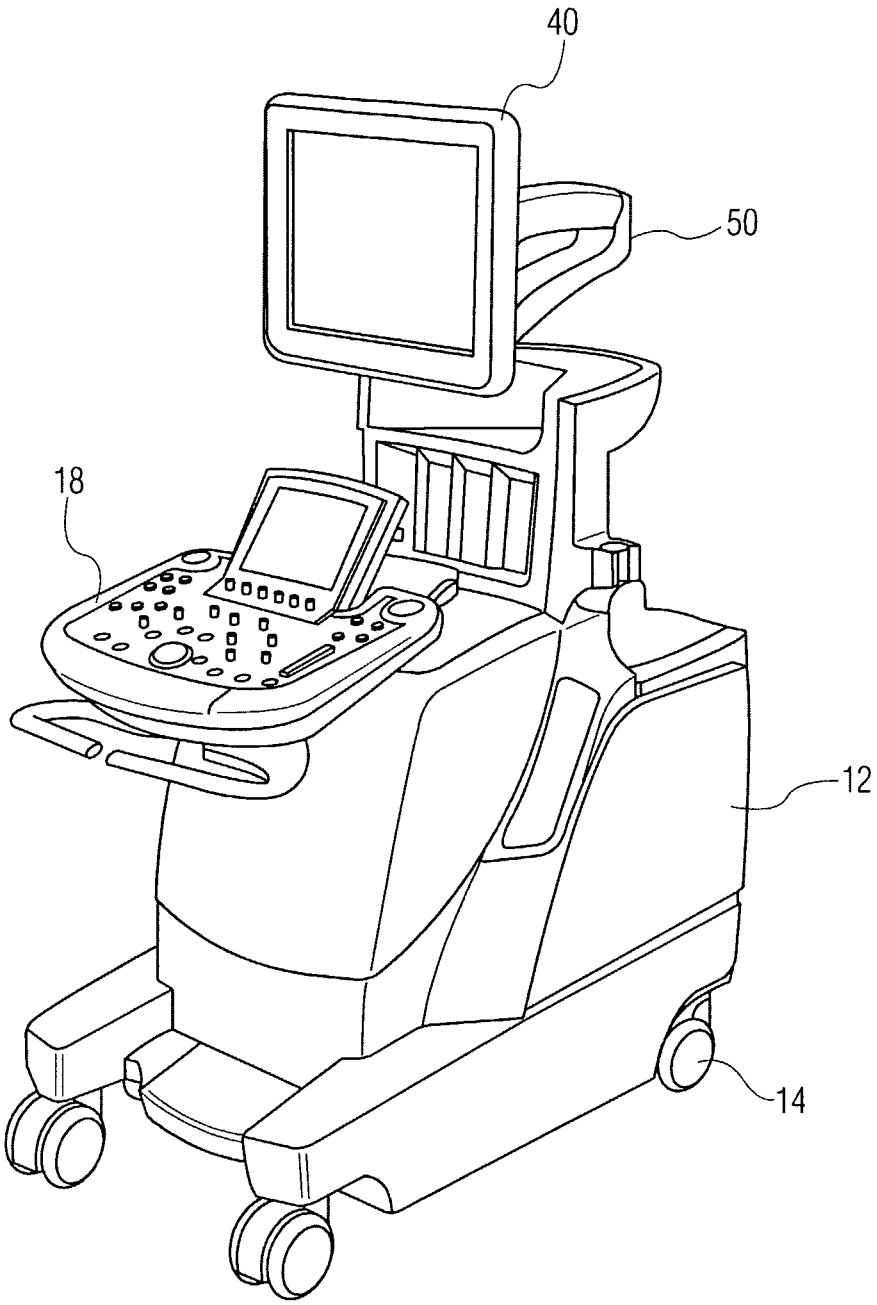


FIG. 12

INTERNATIONAL SEARCH REPORT

Int ›nal Application No
PC1/IB2005/050406

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61B8/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61B F16M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 924 988 A (BURRIS ET AL) 20 July 1999 (1999-07-20) column 1, line 57 - column 2, line 9 column 5, line 48 - column 7, line 22 figures 4,5,7	1-20
A	US 4 625 731 A (QUEDENS ET AL) 2 December 1986 (1986-12-02) column 2, line 34 - column 3, line 59 figure 1	1,16,18
A	US 6 669 639 B1 (MILLER BRAD A ET AL) 30 December 2003 (2003-12-30) column 1, line 40 - line 52 column 4, line 22 - line 41 figures 1,5	1,16,18

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 March 2005	23/03/2005

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Abraham, V

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 595 922 B1 (HENDERSON RICHARD W ET AL) 22 July 2003 (2003-07-22) column 5, line 3 - line 18 figures 7,10	1,16,18
P,X	WO 2004/032743 A (KONINKLIJKE PHILIPS ELECTRONICS N.V; U.S. PHILIPS CORPORATION) 22 April 2004 (2004-04-22) page 2, line 15 - line 23 page 8, line 33 - page 10, line 1 figures 7a-7e	1-20

INTERNATIONAL SEARCH REPORT

Int nal Application No
PCT/IB2005/050406

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5924988 A	20-07-1999	NONE	
US 4625731 A	02-12-1986	JP 61179139 A	11-08-1986
US 6669639 B1	30-12-2003	JP 2004344636 A	09-12-2004
US 6595922 B1	22-07-2003	NONE	
WO 2004032743 A	22-04-2004	US 2004068185 A1 WO 2004032743 A1	08-04-2004 22-04-2004

专利名称(译)	诊断超声系统，带有可抓握的铰接式平板显示器		
公开(公告)号	EP1713397A1	公开(公告)日	2006-10-25
申请号	EP2005702849	申请日	2005-01-31
[标]申请(专利权)人(译)	皇家飞利浦电子股份有限公司		
申请(专利权)人(译)	皇家飞利浦电子N.V.		
当前申请(专利权)人(译)	皇家飞利浦电子N.V.		
[标]发明人	MESAROS ROBERT		
发明人	MESAROS, ROBERT		
IPC分类号	A61B8/00 F16M11/04		
CPC分类号	A61B8/00 A61B8/4405 A61B8/462 F16M11/10 F16M11/2014 F16M11/2092 F16M11/24 F16M11/42 F16M2200/063		
优先权	60/542794 2004-02-06 US		
外部链接	Espacenet		

摘要(译)

超声诊断成像系统（10）包括用于观察由超声系统产生的图像的铰接平板显示器（40）。通过抓住显示屏（42）的周边并用一只手将显示屏（42）移动到所需的观看位置，平板显示器（40）铰接到所需的观察位置。围绕显示屏的边框（44）的轮廓和形状由类似强盗的材料形成，该材料可以与使用者的手的拇指接合，并且与边框（44）相对的显示器外壳的背面包含穿孔（48）。可以与用户的手指接触。夹持穿孔（48）还提供平板显示器（40）的通风。