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(54) MEDICAL SYSTEM WHICH INCLUDES A BACKPACK POUCH

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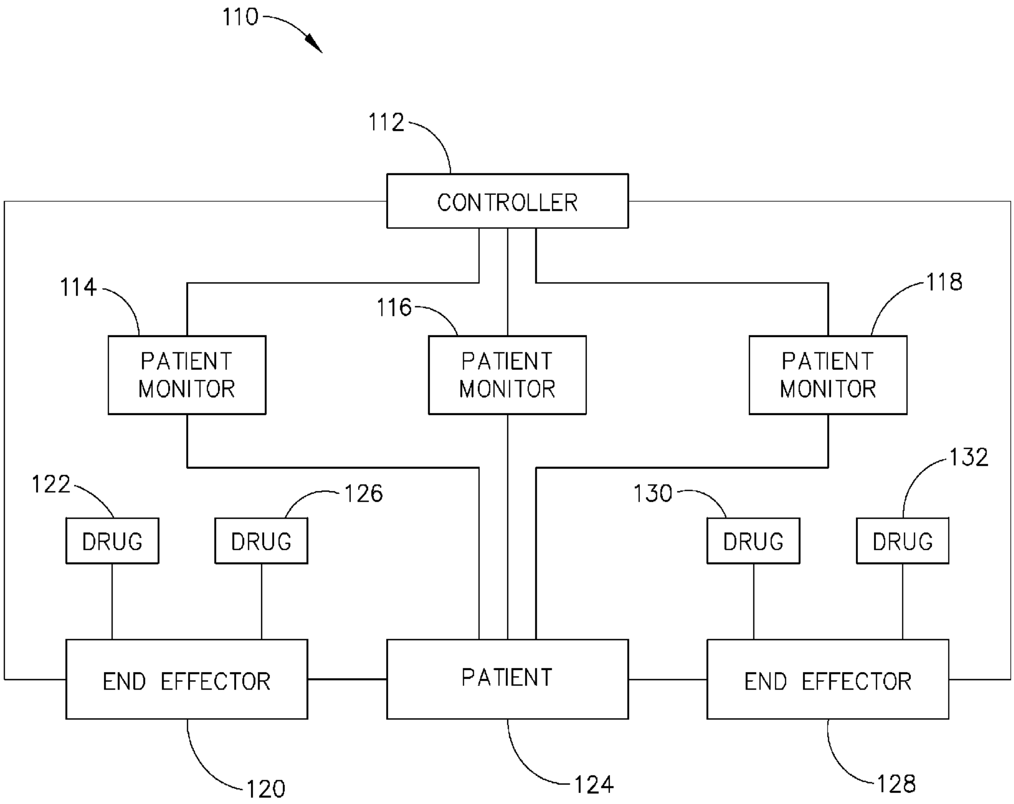
(57) ABSTRACT

A medical system includes a folding backpack pouch adapted to be carried by a person, a patient monitoring module, and a laptop computer adapted to display a physiological parameter measured by the patient monitoring module. The patient monitoring module and the laptop computer are held by corresponding first and second panels of the pouch.



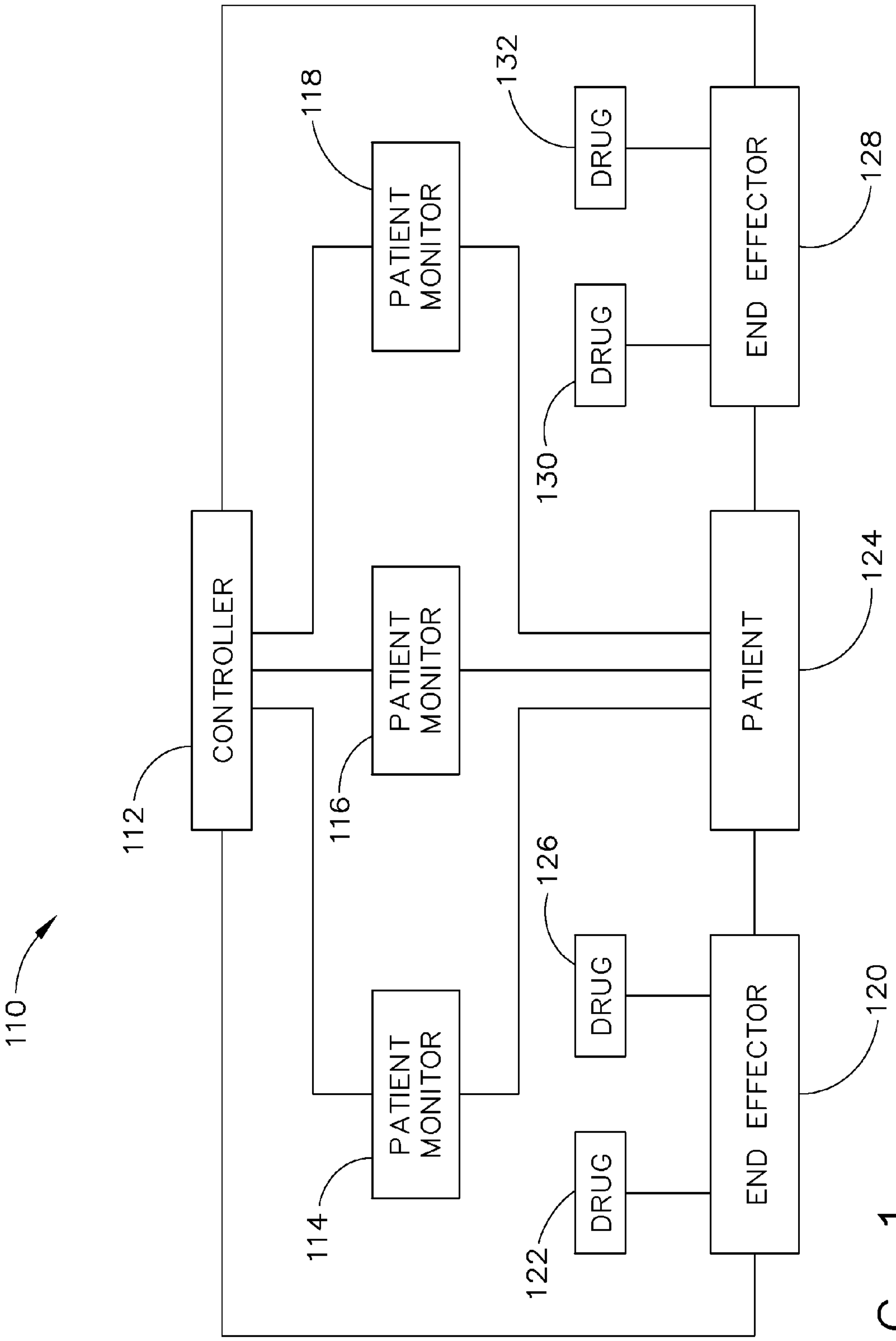

110
112
CONTROLLER
114
PATIENT MONITOR
116
PATIENT MONITOR
118
PATIENT MONITOR
120
END EFFECTOR
122
DRUG
124
PATIENT
126
DRUG
128
END EFFECTOR
130
DRUG
132
DRUG

FIG. 1

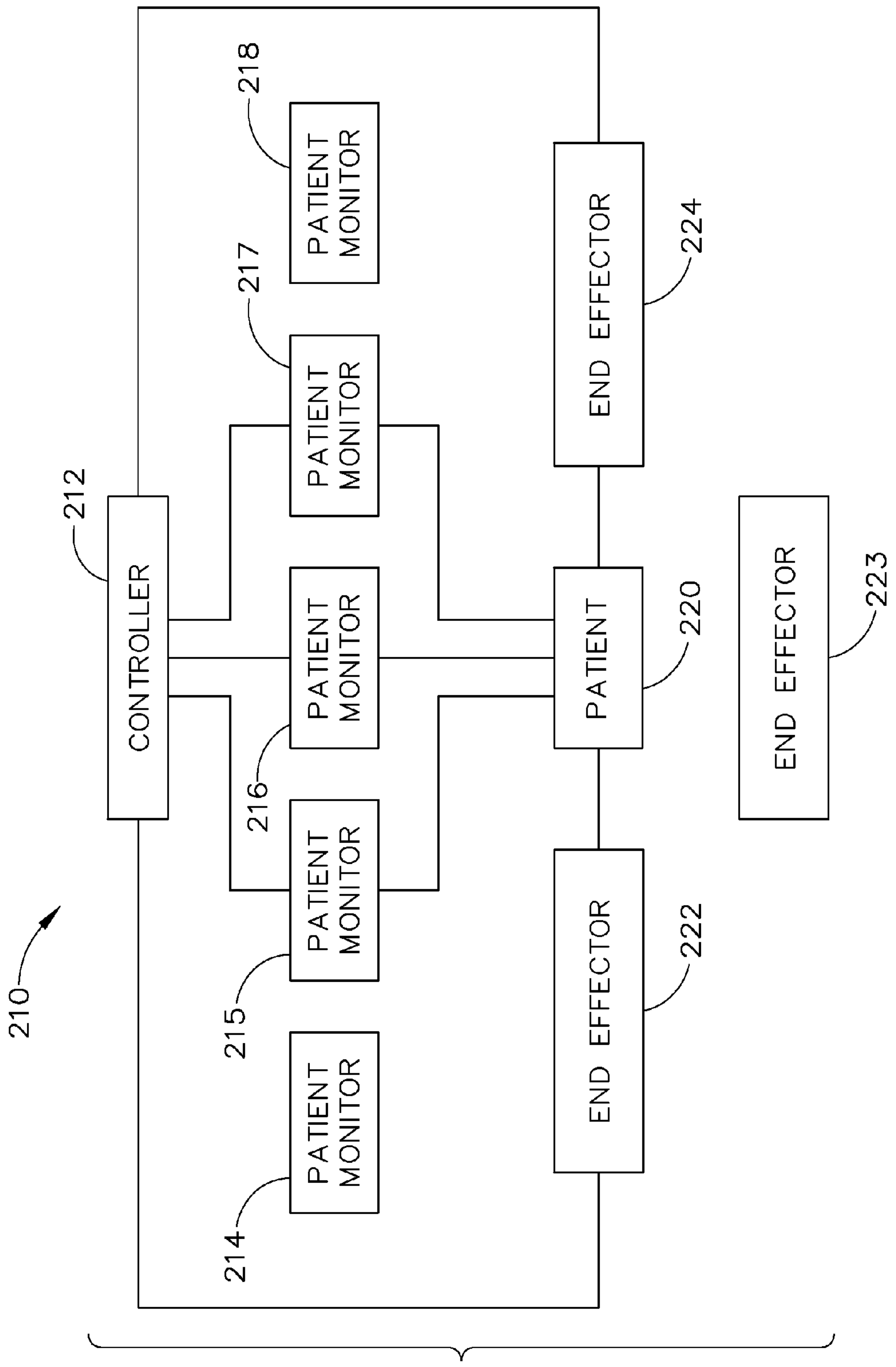

210
212
CONTROLLER
214
PATIENT MONITOR
215
PATIENT MONITOR
216
PATIENT MONITOR
217
PATIENT MONITOR
218
PATIENT MONITOR
220
PATIENT
222
END EFFECTOR
223
END EFFECTOR
224
END EFFECTOR

FIG. 2

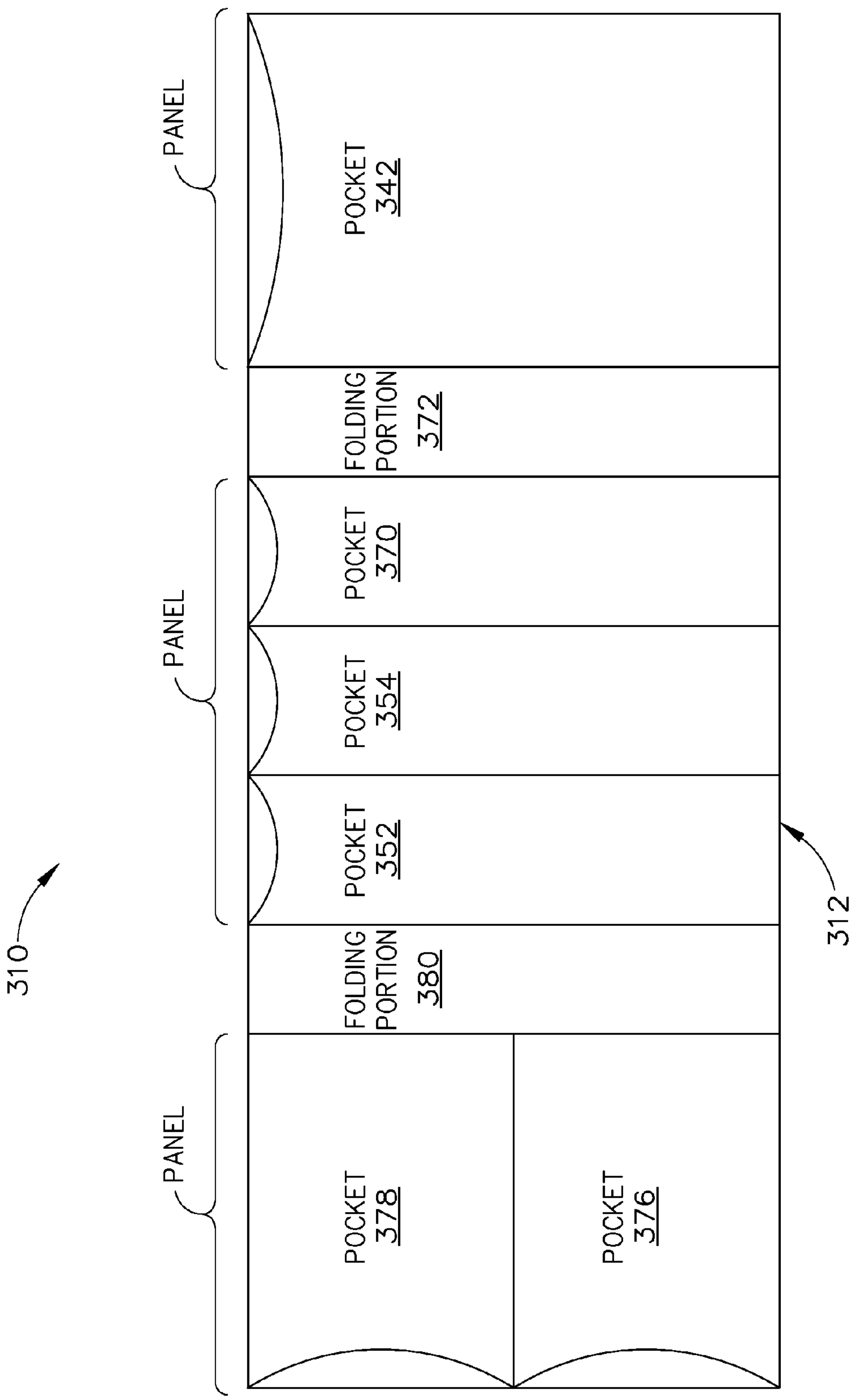
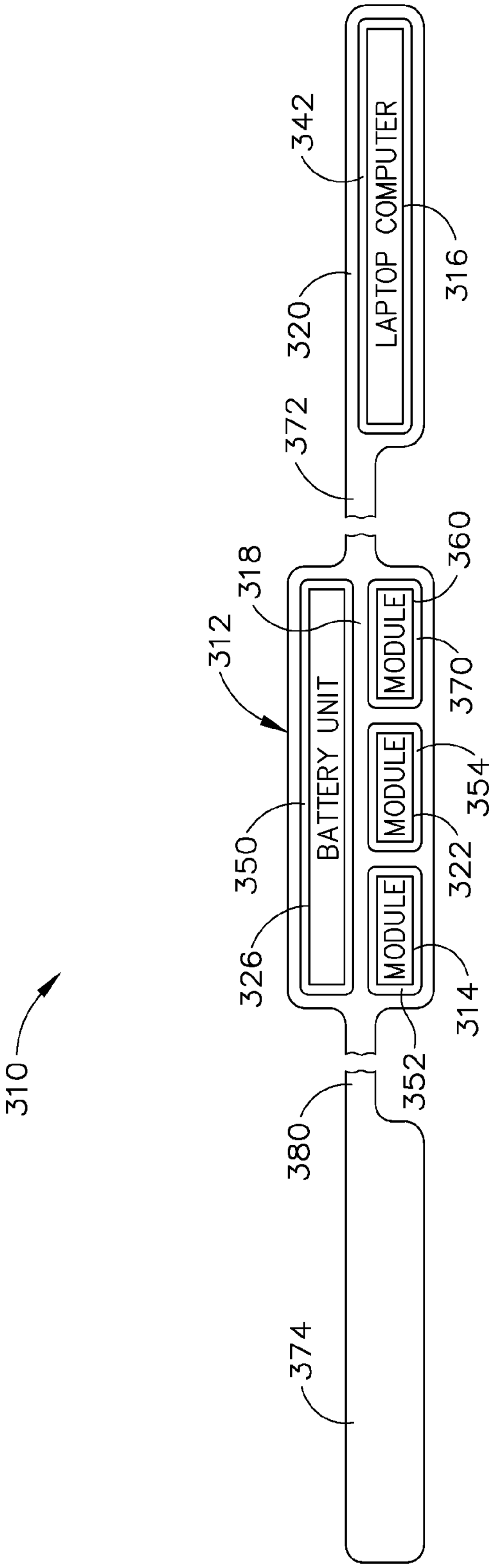

PANEL
POCKET 342
FOLDING PORTION 372
POCKET 370
POCKET 354
POCKET 352
PANEL
FOLDING PORTION 380
PANEL
POCKET 378
POCKET 376
310
312

FIG. 3



310
312
LAPTOP COMPUTER
BATTERY UNIT
MODULE
MODULE
MODULE
342
316
320
372
318
360
370
354
322
350
326
314
352
380
374

FIG. 4

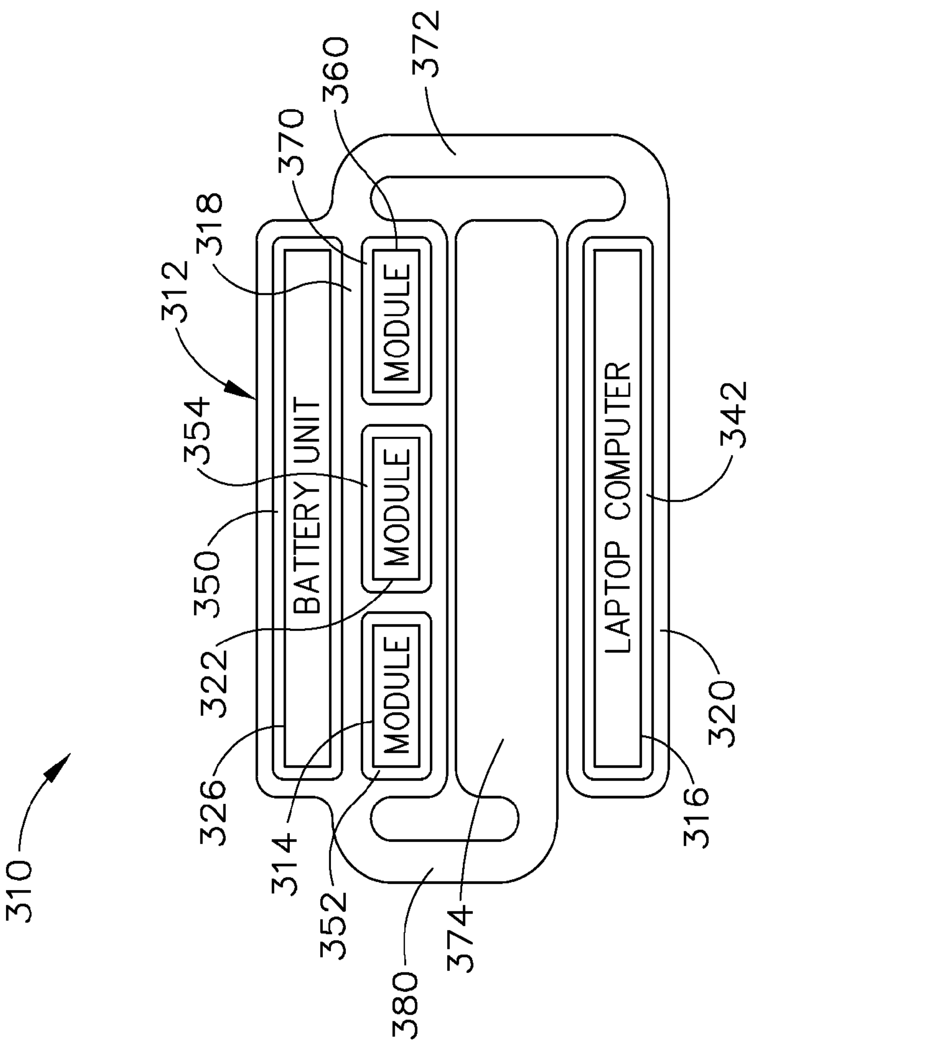
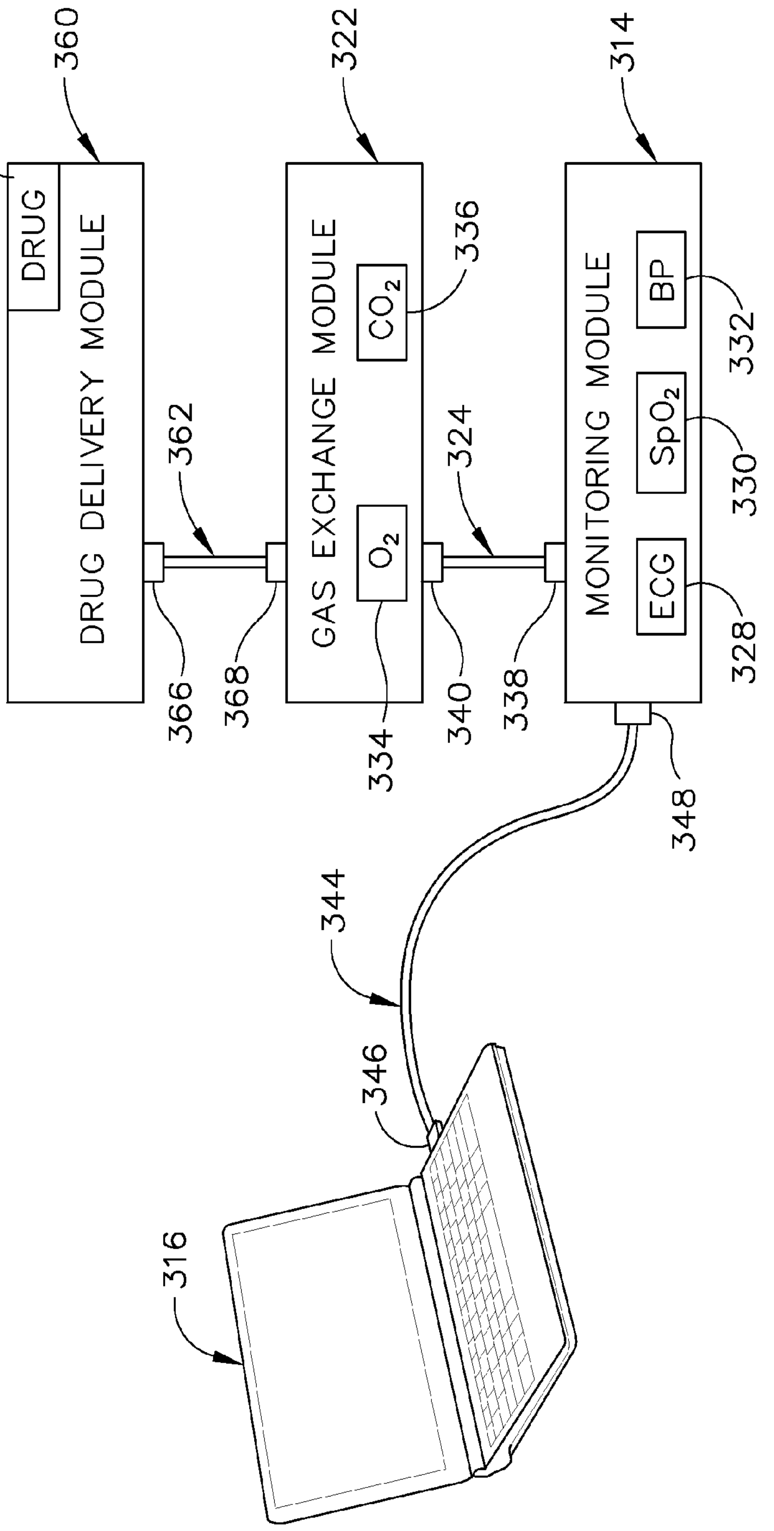

310
312
318
370
360
372
MODULE
MODULE
MODULE
BATTERY UNIT
LAPTOP COMPUTER
354
350
322
326
314
352
380
374
316
320
342

FIG. 5



364
360
322
314
DRUG
DRUG DELIVERY MODULE
GAS EXCHANGE MODULE
CO_2
336
O_2
MONITORING MODULE
BP
SpO_2
ECG
362
324
332
330
328
366
368
334
340
338
348
344
346
316

FIG. 6

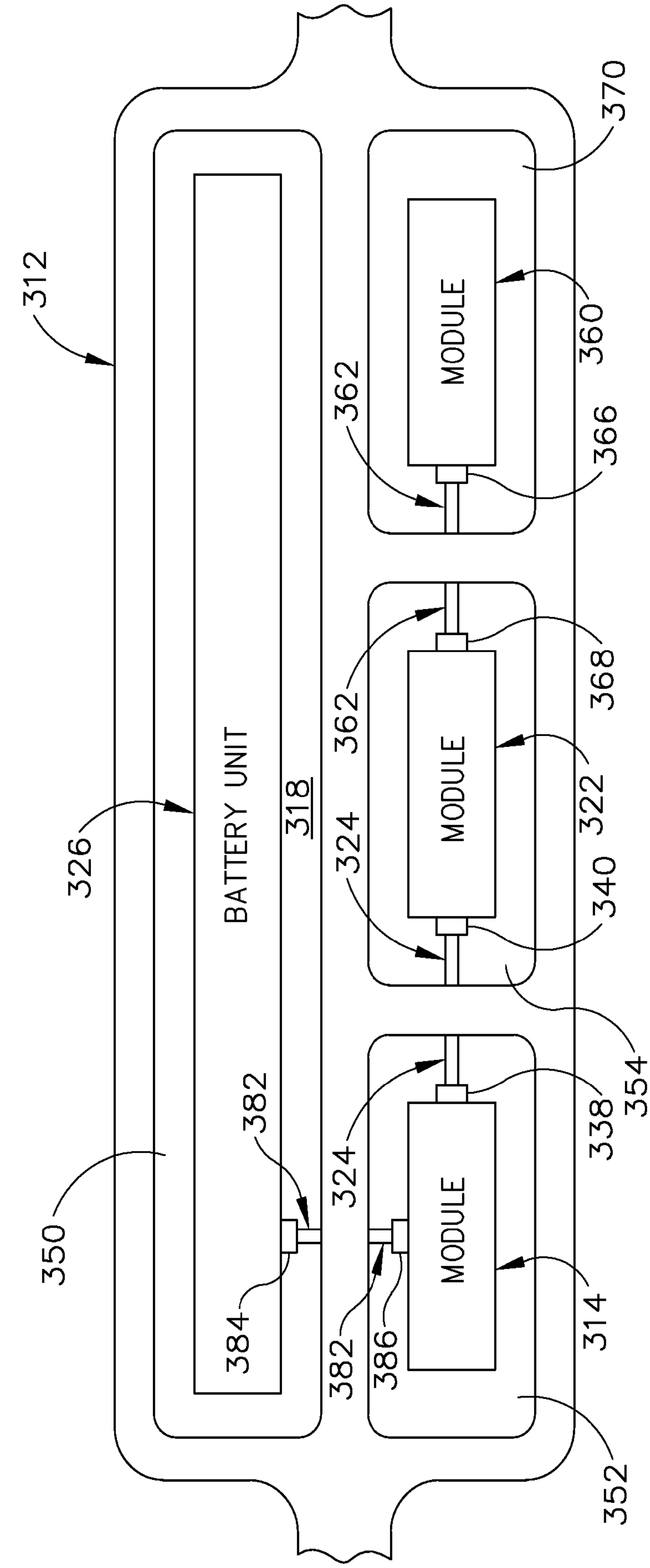

BATTERY UNIT
318
MODULE
MODULE
MODULE
312
326
350
382
384
382
386
324
338
354
314
352
362
324
340
322
368
362
360
366
370

FIG. 7

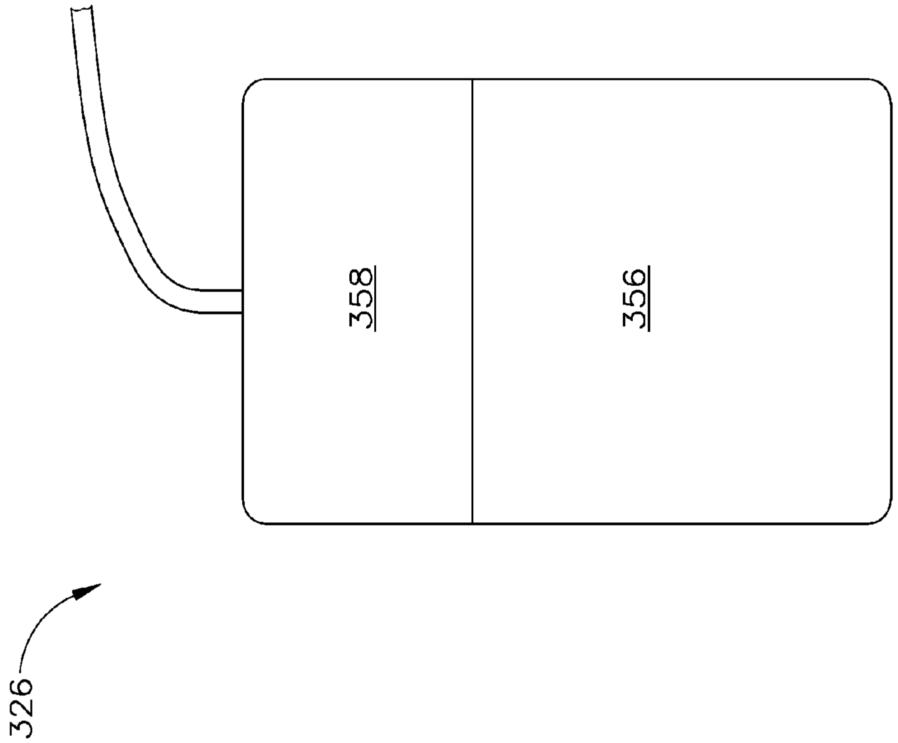


FIG. 8

MEDICAL SYSTEM WHICH INCLUDES A BACKPACK POUCH

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application Ser. No. 61/196,708 filed on Jul. 10, 2008, the entire contents of which are hereby incorporated by reference.

FIELD OF THE INVENTION

[0002] The present invention is related generally to medical technology, and more particularly to a medical system which includes a backpack pouch.

BACKGROUND OF THE INVENTION

[0003] Known medical systems include those which control delivery of a drug to a patient. One known example is a stand-alone IV (intravenous) pump programmed by a user to deliver a volume of a drug at a prescribed fixed flow rate and to alarm before the full volume is delivered. Conventional IV pumps include an IV pump which has an AC-rechargeable battery capable of operating the IV pump (without the IV pump being plugged into an AC power source) for a period of several hours and which is sized to fit into a storage compartment of a hiker's backpack.

[0004] Another known example of such a medical system is a preconfigured conscious sedation system having a bedside monitoring unit including a pulse oximeter which measures the pulse rate and the SpO_2 (saturation of peripheral oxygen) level of the patient and including a blood pressure module which measures the systolic blood pressure level and the diastolic blood pressure level of the patient. The bedside monitoring unit travels with the patient from the preparation room to the procedure room. Then, the bedside monitoring unit is connected by a cable to a procedure room unit which has a wired display monitor, wherein the pulse rate, the SpO_2 respiration rate, the systolic blood pressure level, and the diastolic blood pressure level (and other predetermined physiological parameters of the patient) measured by the preconfigured bedside monitoring unit are displayed on the display monitor.

[0005] The procedure room unit includes a controller which computes a flow rate to deliver a sedation drug intravenously to the patient for a predetermined medical procedure. The controller computes the flow rate based on all of the predetermined physiological parameters of the patient measured by the preconfigured bedside monitoring unit. The controller sends a flow-rate command to an IV pump assembly, wherein the flow-rate command changes with changes in the measured physiological parameters of the patient.

[0006] Still, scientists and engineers continue to seek improved medical systems.

SUMMARY

[0007] An expression of a first embodiment of the invention is for a medical system including a medical-system controller. The controller is operatively connectable to a distributed plurality of predetermined patient monitors to receive at least one physiological parameter measured by each of the plurality of patient monitors. The controller is adapted to choose a first group of the patient monitors for a predetermined first medical procedure and a predetermined drug-delivering first medical effector. The controller is operatively connectable to the first medical effector and, when operatively connected, is adapted to control a flow rate of a drug from the first medical effector to a patient for the first medical procedure using at least the received measured physiological parameters from the chosen first group of the patient monitors, when the controller is operatively connected to the patient monitors, without using any other physiological parameter of the patient. The controller is adapted to choose a second group of the patient monitors different from the first group for a different predetermined second medical procedure and the first medical effector. The controller, when operatively connected to the first medical effector, is adapted to control a flow rate of a drug from the first medical effector to the patient for the second medical procedure using at least the received measured physiological parameters from the chosen second group of the patient monitors, when the controller is operatively connected to the patient monitors, without using any other physiological parameter of the patient.

[0008] An expression of a second embodiment of the invention is for a medical system including a medical-system controller. The controller is connectable to up to a distributed plurality P of patient monitors which are operatively connectable to a patient to each measure at least one physiological parameter of the patient. The controller is connectable to up to a distributed multiplicity M of drug-delivering medical effectors which are operatively connectable to the patient and which are adapted to identify themselves when queried. The controller is adapted to identify, by querying, connected ones of the M medical effectors and connected ones of the P patient monitors. The controller is adapted to control at least one of the identified connected ones of the M medical effectors using at least the physiological parameters supplied by at least some of the identified connected ones of the P patient monitors for a predetermined medical procedure.

[0009] A first expression of a third embodiment of the invention is for a medical system including a folding backpack pouch, a no-tool-user-replaceable patient monitoring module, and a no-tool-user-removable laptop computer. The backpack pouch is adapted to be carried by a person and includes first and second panels together having an open position wherein the first and second panels are disposed side by side and having a closed position wherein one of the first and second panels overlies the other of the first and second panels. The patient monitoring module is held by the first panel and is adapted to measure at least one physiological parameter of a patient. The laptop computer is held by the second panel, wherein the laptop computer is operatively connectable to the patient monitoring module and is adapted to display the measured at-least-one physiological parameter of the patient.

[0010] A second expression of a third embodiment of the invention is for a medical system including a folding backpack pouch, a no-tool-user-replaceable patient monitoring module, a no-tool-user-replaceable patient gas-exchange module, a first inter-module connecting cable, a battery unit, and a no-tool-user-removable laptop computer. The backpack pouch is adapted to be carried by a person and includes first and second panels together having an open position wherein the first and second panels are disposed side by side and having a closed position wherein one of the first and second panels overlies the other of the first and second panels. The patient monitoring module is held by the first panel and includes an ECG (electrocardiogram) medical unit, an SpO_2

(saturation of peripheral oxygen) medical unit, and a blood pressure medical unit each operatively connectable to a patient. The patient gas-exchange module is held by the first panel and includes an oxygen-delivery medical unit and a CO_2 (carbon dioxide) monitoring medical unit each operatively connectable to the patient. The first inter-module connecting cable is affixed to the backpack pouch, has a plug connected to the patient monitoring module, and has a plug connected to the patient gas-exchange module. The battery unit is held by the first panel and is adapted to power the patient monitoring module and the patient gas-exchange module. The laptop computer is held by the second panel. The laptop computer is operatively connectable to the patient monitoring module and is adapted to display data from the ECG, SpO_2, and blood pressure medical units. The laptop computer is operatively connectable to the patient gas-exchange module through the patient monitoring module, and wherein the laptop computer is adapted to display data from the CO_2 monitoring medical unit and to control the oxygen-delivery medical unit to deliver oxygen to the patient.

[0011] Several benefits and advantages are obtained from one or more of the expressions of the embodiments of the invention. In one example of the first embodiment, a medical-system controller is provided which is connectable to a distributed plurality of predetermined patient monitors and which adapts its choice of patient monitors to use depending on the particular medical procedure to be performed. In one example of the second embodiment, a medical-system controller is provided which is connectable to a distributed plurality of patient monitors and a distributed multiplicity of drug-delivering medical effectors, which identifies connected one of the medical effectors and patient monitors, and which controls at least one of the connected ones of the medical effectors using at least some of the connected ones of the patient monitors for a predetermined medical procedure. In one example of the third embodiment, a medical system is provided which includes patient modules stored in a folding backpack pouch which can be carried by a person, either by being adapted with carrying straps or by being placed in a knapsack having carrying straps, allowing use of the medical system in the field.

BRIEF DESCRIPTION OF THE FIGURES

[0012] FIG. **1** is schematic diagram of a first embodiment of a medical system of the invention wherein a medical-system controller is connected to three predetermined patient monitors and two predetermined drug-delivering medical effectors;

[0013] FIG. **2** is a schematic diagram of a second embodiment of a medical system of the invention including a medical-system controller, five patient monitors and three drug-delivering medical effectors, wherein the medical-system is shown connected to three of the five patient monitors and to two of the three drug-delivering medical effectors;

[0014] FIG. **3** is a schematic front view of a third embodiment of a medical system of the invention showing a folding backpack pouch in an unfolded state;

[0015] FIG. **4** is a top view of the backpack pouch of FIG. **3** showing a laptop computer, a patient monitoring module, a patient gas-exchange module, a drug-delivery module, and a battery unit stored in the backpack pouch;

[0016] FIG. **5** is a view, as in FIG. **4**, but with the backpack pouch in a folded state;

[0017] FIG. **6** is a diagrammatic view showing the interconnections of the laptop computer and the three modules of FIG. **4**;

[0018] FIG. **7** is an enlarged view of a portion of FIG. **4** showing the connecting cables affixed to the backpack pouch and having plugs for connecting to the modules and the battery unit; and

[0019] FIG. **8** is a schematic view of the battery unit removed from the backpack pouch.

DETAILED DESCRIPTION

[0020] Before explaining the expressions of several embodiments of the invention in detail, it should be noted that each is not limited in its application or use to the details of construction and arrangement of parts, instructions, and steps illustrated in the accompanying drawings and description. The illustrative embodiments of the invention may be implemented or incorporated in other embodiments, variations, and modifications, and may be practiced or carried out in various ways. Furthermore, unless otherwise indicated, the terminology employed herein has been chosen for the purpose of describing the illustrative expressions of the embodiments of the present invention for the convenience of the reader and not for the purpose of limiting the invention.

[0021] It is further understood that any one or more of the following-described expressions of a medical system, implementations, etc. can be combined with any one or more of the other following-described expressions of a medical system, implementations, etc.

[0022] A first embodiment of the invention is shown in FIG. **1**. A first expression of the embodiment of FIG. **1** is for a medical system **110** including a medical-system controller **112**. The controller **112** is operatively connectable to a distributed plurality of predetermined patient monitors **114**, **116**, and **118** to receive at least one physiological parameter measured by each of the plurality of patient monitors **114**, **116**, **118**. The controller **112** is adapted to choose a first group of the patient monitors for a predetermined first medical procedure and a predetermined drug-delivering first medical effector **120**. The controller **112** is operatively connectable to the first medical effector **120** and, when operatively connected, is adapted to control a flow rate of a drug **122** from the first medical effector to a patient **124** for the first medical procedure using at least the received measured physiological parameters from the chosen first group of the patient monitors, when the controller **112** is operatively connected to the patient monitors **114**, **116**, and **118**, without using any other physiological parameter of the patient **124**. The controller **112** is adapted to choose a second group of the patient monitors different from the first group for a different predetermined second medical procedure and the first medical effector **120**. The controller **112**, when operatively connected to the first medical effector **120**, is adapted to control a flow rate of a drug **126** from the first medical effector **120** to the patient **124** for the second medical procedure using at least the received measured physiological parameters from the chosen second group of the patient monitors, when the controller **112** is operatively connected to the patient monitors **114**, **116**, and **118**, without using any other physiological parameter of the patient **124**. It is noted that drug **122** and the drug **124** may be the same drug or different drugs. It is noted that the term "drug" includes a combination drug.

[0023] Types of drug-delivering medical effectors include IV pump assemblies which deliver a drug intravenously to a patient, gas delivery pump assemblies which deliver a gaseous drug to a patient via an oral and/or nasal cannula, an electrical stimulator which delivers an electric current (considered a drug for the purposes of describing the embodiments of the invention) to a patient to sedate the patient, and a drug patch and drug-patch control unit wherein the drug patch contains a drug and wherein the drug-patch control unit controls the delivery of the drug to the patient by electrophoresis.

[0024] In one example of the first expression of the embodiment of FIG. **1**, the patient monitors **114**, **116**, and **118** include an ECG (electrocardiogram) patient monitor **114**, a blood pressure patient monitor **116**, and a pulse oximeter patient monitor **118** which measure corresponding physiological parameters of the patient **124**. In one variation, the first medical effector **120** is an IV (intravenous) pump assembly. In one illustration of a first medical procedure (e.g., a colonoscopy), the corresponding drug **122** (such as Propofol) has a sedative effect, and the chosen first group of patient monitors is the group consisting of the ECG patient monitor **114**, the blood pressure patient monitor **116**, and the pulse oximeter patient monitor **118**. In one illustration of a second medical procedure (e.g., an operation to remove the wisdom teeth), the corresponding drug **126** (such as Meperidine) has an analgesic effect, and the chosen second group of patient monitors is the group consisting of the ECG patient monitor **114** and the blood pressure patient monitor **116**. Other illustrations are left to those skilled in the medical arts. In one utilization, a drug to be used by the first medical effector **120** is identified to the controller **112** by a touch screen (not shown) on the controller **112** which displays a list of pre-programmed drugs.

[0025] Another example of a patient monitor (not shown) is a CO_2 (carbon dioxide) patient monitor. An additional example is a sedation level patient monitor which queries a patient for a response (e.g., which buzzes a handpiece at various power levels as a request for the patient to push a button) and which measures the response (e.g., the time delay for the patient to push the button for a particular power level which indicates the level of patient sedation). Other examples are left to those skilled in the medical arts.

[0026] It is within the ordinary level of skill of the artisan to obtain and have programmed a medical-system controller **112** which is adapted: to receive inputs from various predetermined patient monitors **114**, **116**, and **118**; to choose a particular group of such patient monitors to use with a predetermined drug-delivering first medical effector **120** for a user-chosen one of a plurality of predetermined medical procedures, and to control the drug flow of a predetermined drug from the first medical effector **120** to the patient **124** using the chosen group of patient monitors without using non-chosen patient monitors.

[0027] In one implementation of the first expression of the embodiment of FIG. **1**, the controller **112** is adapted to control the flow rate for the first medical procedure despite failure of at least one of the patient monitors of the first group of the patient monitors. In one extension of the first expression of the embodiment of FIG. **1**, the medical system **110** includes the plurality of the patient monitors **114**, **116**, and **118** and the first medical effector **120** wherein each is operatively connected to the controller **112**.

[0028] In a first application of the first expression of the embodiment of FIG. **1**, the controller **112** is adapted to choose a third group of the patient monitors for a third medical procedure and a predetermined drug-delivering second medical effector **128**. The controller **112** is operatively connectable to the second medical effector **128** and, when operatively connected, is adapted to control a flow rate of a drug **130** from the second medical effector **128** to the patient **124** for the third medical procedure using at least the received measured physiological parameters from the chosen third group of the patient monitors, when the controller **112** is operatively connected to the patient monitors **114**, **116**, and **118**, without using any other physiological parameters of the patient **124**. The third group may be the same or different from the first group. The third group may be the same or different from the second group.

[0029] In one variation of the first application, the controller **112** is adapted to control the flow rate for the third medical procedure despite failure of at least one of the patient monitors of the third group of the patient monitors. In one extension of the first application, the medical system **110** includes the plurality of the patient monitors **114**, **116**, and **118**, the first medical effector **120**, and the second medical effector **128** wherein each is operatively connected to the controller **112**.

[0030] In a second application of the first expression of the embodiment of FIG. **1**, the controller **112** is adapted to choose a fourth group of the patient monitors for the first medical procedure and a predetermined drug-delivering second medical effector **128**. The controller **112** is operatively connectable to the second medical effector **128** and, when operatively connected, is adapted to control a flow rate of a drug **132** from the second medical effector **128** to the patient **124** for the first medical procedure using at least the received measured physiological parameters from the chosen fourth group of the patient monitors, when the controller **112** is operatively connected to the patient monitors **114**, **116**, and **118**, without using any other physiological parameter of the patient **124**.

[0031] It is noted that the drugs **122**, **126**, **130** and **132** may be the same drug or different drugs. It is also noted that the fourth group may be the same or different from the first group. It is further noted that the fourth group may be the same or different from the second group. In one variation of the second application, the controller **112** is adapted to control the flow rate of the drug **122** of the first medical effector **120** for the first medical procedure despite failure of the second medical effector **128**.

[0032] A second embodiment of the invention is shown in FIG. **2**. A first expression of the embodiment of FIG. **2** is for a medical system **210** including a medical-system controller **212**. The controller **212** is connectable to up to a distributed plurality P of patient monitors **214**, **215**, **216**, **217**, and **218** which are operatively connectable to a patient **220** to each measure at least one physiological parameter of the patient **220**. The controller **212** is connectable to up to a distributed multiplicity M of drug-delivering medical effectors **222**, **223**, and **224** which are operatively connectable to the patient **220** and which are adapted to identify themselves when queried. The controller **212** is adapted to identify, by querying, connected ones of the M medical effectors **222-224** and connected ones of the P patient monitors **214-218**. The controller **212** is adapted to control at least one of the identified connected ones **222** and **224** of the M medical effectors using at least the physiological parameters supplied by at least some of the identified connected ones **215**, **216**, and **217** of the P patient monitors for a predetermined medical procedure.

[0033] Connections of the patient monitors and the medical effectors may be parallel connections, serial connections, or combinations of both and include wired and wireless connections. It is noted that unconnected ones **214** and **218** of the plurality P of patient monitors and unconnected ones **223** of the multiplicity M of medical effectors my be unconnected in the physical sense for wired connections (as shown in FIG. **2** where only wired connections are present) or unconnected in the operative sense (e.g., a physically connected patient monitor or a wirelessly-connected patient monitor may be turned off and unable to communicate with the controller). It is also noted that P is the number of the plurality of the patient monitors, and M is the number of the multiplicity of medical effectors. In FIG. **2**, P equals 5 and M equals 3. Other values of P and M are left to those skilled in the medical arts.

[0034] In one extension of the first expression of the embodiment of FIG. **2**, the medical system **210** includes the plurality P of the patient monitors **214**, **215**, **216**, **217**, and **218** and the multiplicity M of the medical effectors **222**, **223** and **224**.

[0035] In one deployment of the first and/or second embodiment, each peripheral component (i.e. each patient monitor and each medical effector) may have a basic algorithm, wherein the medical system provides more complex behaviors. A peripheral component may serve as a signal repeater increasing the range of wireless peripheral components. A peripheral component may provide its own power through a battery or AC connection or receive power from a wire-connected peripheral component. A peripheral component may provide its own computation and alarm settings or leverage those from another peripheral component.

[0036] A third embodiment of the invention is shown in FIGS. **3-8**. A first expression of the embodiment of FIGS. **3-8** is for a medical system **310** including a folding backpack pouch **312**, a no-tool-user-replaceable patient monitoring module **314**, and a no-tool-user-removable laptop computer **316**. The backpack pouch **312** is adapted to be carried by a person and includes first and second panels **318** and **320** together having an open position (see FIGS. **3-4**) wherein the first and second panels **318** and **320** are disposed side by side and having a closed position (see FIG. **5**) wherein one of the first and second panels **318** and **320** overlies the other of the first and second panels **318** and **320**. The patient monitoring module **314** is held by the first panel **318** and is adapted to measure at least one physiological parameter of a patient. The laptop computer **316** is held by the second panel **320**, wherein the laptop computer **316** is operatively connectable to the patient monitoring module **314** and is adapted to display the measured at-least-one physiological parameter of the patient.

[0037] It is noted that a backpack pouch is a pouch which can be carried by a person, either by being adapted with carrying straps or (as in the example of FIG. **5**) by being adapted to be placed in a knapsack having carrying straps, allowing use of the medical system in the field. It is also noted that each of the first and second panels **318** and **320** may be rigid or flexible.

[0038] In one implementation of the first expression of the embodiment of FIGS. **3-8**, the medical system **310** also includes a no-tool-user-replaceable patient gas-exchange module **322** held by the first panel **318** and adapted to exchange at least one gas with the patient, wherein the laptop computer **316** is operatively connectable to the patient gas-exchange module **322**.

[0039] A second expression of the embodiment of FIGS. **3-8** is for a medical system **310** including a folding backpack pouch **312**, a no-tool-user-replaceable patient monitoring module **314**, a no-tool-user-replaceable patient gas-exchange module **322**, a first inter-module connecting cable **324** (e.g., a ribbon cable), a battery unit **326**, and a no-tool-user-removable laptop computer **316**. The backpack pouch **312** is adapted to be carried by a person and includes first and second panels **318** and **320** together having an open position (see FIGS. **3-4**) wherein the first and second panels **318** and **320** are disposed side by side and having a closed position (see FIG. **5**) wherein one of the first and second panels **318** and **320** overlies the other of the first and second panels **318** and **320**.

[0040] The patient monitoring module **314** is held by the first panel **318** and includes an ECG (electrocardiogram) medical unit **328**, an SpO_2 (saturation of peripheral oxygen) medical unit **330**, and a blood pressure (BP) medical unit **332** each operatively connectable to a patient. The patient gas-exchange module **322** is held by the first panel **318** and includes an oxygen-delivery (O_2-delivery) medical unit **334** and a CO_2 (carbon dioxide) monitoring medical unit **336** each operatively connectable to the patient. The first inter-module connecting cable **324** is affixed to the backpack pouch **312**, has a plug **338** connected to the patient monitoring module **314**, and has a plug **340** connected to the patient gas-exchange module **322**. The battery unit **326** is held by the first panel **318** and is adapted to power the patient monitoring module **314** and the patient gas-exchange module **322**.

[0041] The laptop computer **316** is held by the second panel **320**. The laptop computer **316** is operatively connectable to the patient monitoring module **314** and is adapted to display data from the ECG, SpO_2, and blood pressure medical units **328**, **330**, and **332**, wherein the laptop computer **316** is operatively connectable to the patient gas-exchange module **322** through the patient monitoring module **314**. The laptop computer **316** is adapted to display data from the CO_2 monitoring medical unit **336** and to control the oxygen-delivery medical unit **334** to deliver oxygen to the patient. It is noted that the term "oxygen" includes oxygen-enriched air, that "oxygen" is considered to be a drug, and that an oxygen-delivery medical unit **334** is a medical unit capable of delivering oxygen. It is also noted that other gases (such as nitrous oxide) can be used instead of oxygen in the oxygen-delivery medical unit **334** for a particular medical procedure. It is further noted that an example of an SpO_2 medical unit **330** is a pulse oximeter, and an example of a CO_2 monitoring medical unit **336** is a capnometer.

[0042] In one implementation of the second expression of the embodiment of FIGS. **3-8**, the second panel **320** includes a pocket **342** for holding the laptop computer **316**, and the medical system **310** also includes a computer cable **344** (e.g., a USB or Ethernet cable) having a plug **346** connectable to the laptop computer **316** and having a plug **348** connectable to the patient monitoring module **314**. In one utilization, the patient-monitoring module **314** and the patient gas-exchange module **322** remain stored in the backpack pouch **312** during medical use, and the laptop computer **316** is removed from the backpack pouch **312** during medical use. In a different implementation, not shown, a hook and loop type attachment (such as a Velcro® attachment) holds the patient-monitoring module and the patient gas-exchange module to the first panel and holds the laptop computer to the second panel, wherein the laptop computer remains attached to the second panel during medical use.

[0043] In the same or a different implementation, the first panel **318** includes a pocket **350** on a back side of the first panel **318** for holding the battery unit **326**. The first panel **318**

includes a pocket **352** on a front side of the first panel **318** for holding the patient monitoring module **314**. The first panel **318** includes a pocket **354** on the front side of the first panel **318** for holding the patient gas-exchange module **322**. In one variation, the battery unit **326** includes a rechargeable battery **356** and a hand-crank battery recharger **358**.

[0044] In a first enablement of the second expression of the embodiment of FIGS. **3-8**, the medical system **310** includes a patient drug delivery module **360** (e.g., an IV pump assembly) and a second inter-module connecting cable **362** (e.g., a ribbon cable). The patient drug delivery module **360** is held by the first panel **318** and is operatively connectable to a patient to deliver a drug **364** to the patient. The second inter-module connecting cable **362** is affixed to the backpack pouch **312**, has a plug **366** connected to the patient drug delivery module **360**, and has a plug **368** connected to the patient gas-exchange module **322**. The battery unit **326** is adapted to power the patient drug delivery module **360**. The laptop computer **316** is operatively connectable to the patient drug delivery module **360** through the patient gas exchange module **322** and the patient monitoring module **314**. The laptop computer **316** is adapted to control the patient drug delivery module **360** to control a flow rate of the drug **364** to the patient for a predetermined medical procedure using the data from at least a plurality of the ECG, SpO_2, blood pressure, and CO_2 monitoring medical units **328**, **330**, **332**, and **336**.

[0045] In one application of the first enablement, the first panel **318** includes a pocket **370** on the front side of the first panel **318** for holding the patient drug delivery module **360**. In the same or a different application, the drug **364** has at least one medical effect on the patient chosen from the group consisting of a sedative effect and an analgesic effect.

[0046] In one construction of the second expression of the embodiment of FIGS. **3-8**, the backpack pouch **312** includes a first folding portion **372** interconnecting the first and second panels **318** and **320** to facilitate folding. In one extension, the backpack pouch **312** includes a third panel **374** having a pocket **376** for storing multiple-patient-use items (not shown) such as an ECG cable and leads, an SpO_2 cable and probe, a blood pressure cable and cuff, and, if required, an oxygen bottle adapted to attach to the oxygen-delivery medical unit **334**. In the same or a different extension, the third panel **374** has a pocket **378** for storing single-patient-use items (not shown) such as an oral/nasal cannula, and an IV line. In one variation, the backpack pouch **312** includes a second folding portion **380** interconnecting the first and third panels **318** and **374** to facilitate folding. In one modification, the medical system **310** includes a battery connection cable **382** affixed to the backpack pouch **312**, having a plug **384** connected to the battery unit **326** and having a plug **386** connected to the patient-monitoring module **314**. In one construction, the backpack pouch **312**, including the panels, folding portions, and the pockets, is made from canvas material. Other constructions are left to the artisan.

[0047] Several benefits and advantages are obtained from one or more of the expressions of the embodiments of the invention. In one example of the first embodiment, a medical-system controller is provided which is connectable to a distributed plurality of predetermined patient monitors and which adapts its choice of patient monitors to use depending on the particular medical procedure to be performed. In one example of the second embodiment, a medical-system controller is provided which is connectable to a distributed plurality of patient monitors and a distributed multiplicity of drug-delivering medical effectors, which identifies connected one of the medical effectors and patient monitors, and which controls at least one of the connected ones of the medical effectors using at least some of the connected ones of the patient monitors for a predetermined medical procedure. In one example of the third embodiment, a medical system is provided which includes patient modules stored in a folding backpack pouch which can be carried by a person, either by being adapted with carrying straps or by being placed in a knapsack having carrying straps, allowing use of the medical system in the field.

[0048] While the present invention has been illustrated by expressions of several embodiments, and enablements, implementations, etc. thereof, it is not the intention of the applicants to restrict or limit the spirit and scope of the appended claims to such detail. Numerous other variations, changes, and substitutions will occur to those skilled in the art without departing from the scope of the invention. It will be understood that the foregoing description is provided by way of example, and that other modifications may occur to those skilled in the art without departing from the scope and spirit of the appended Claims.

What is claimed is:

1. A medical system comprising:

a) a folding backpack pouch adapted to be carried by a person and including first and second panels together having an open position wherein the first and second panels are disposed side by side and having a closed position wherein one of the first and second panels overlies the other of the first and second panels;

b) a no-tool-user-replaceable patient monitoring module held by the first panel and adapted to measure at least one physiological parameter of a patient; and

c) a no-tool-user-removable laptop computer held by the second panel, wherein the laptop computer is operatively connectable to the patient monitoring module and is adapted to display the measured at-least-one physiological parameter of the patient.

2. The medical system of claim **1**, also including a no-tool-user-replaceable patient gas-exchange module held by the first panel and adapted to exchange at least one gas with the patient, wherein the laptop computer is operatively connectable to the patient gas-exchange module.

3. A medical system comprising:

a) a folding backpack pouch adapted to be carried by a person and including first and second panels together having an open position wherein the first and second panels are disposed side by side and having a closed position wherein one of the first and second panels overlies the other of the first and second panels;

b) a no-tool-user-replaceable patient monitoring module held by the first panel and including an ECG (electrocardiogram) medical unit, an SpO_2 (saturation of peripheral oxygen) medical unit, and a blood pressure medical unit each operatively connectable to a patient;

c) a no-tool-user-replaceable patient gas-exchange module held by the first panel and including an oxygen-delivery medical unit and a CO_2 (carbon dioxide) monitoring medical unit each operatively connectable to the patient;

d) a first inter-module connecting cable affixed to the backpack pouch, having a plug connected to the patient monitoring module, and having a plug connected to the patient gas-exchange module;

e) a battery unit held by the first panel and adapted to power the patient monitoring module and the patient gas-exchange module; and

f) a no-tool-user-removable laptop computer held by the second panel, wherein the laptop computer is operatively connectable to the patient monitoring module and is adapted to display data from the ECG, SpO_2, and blood pressure medical units, wherein the laptop computer is operatively connectable to the patient gas-exchange module through the patient monitoring module, and wherein the laptop computer is adapted to display data from the CO_2 monitoring medical unit and to control the oxygen-delivery medical unit to deliver oxygen to the patient.

4. The medical system of claim **3**, wherein the second panel includes a pocket for holding the laptop computer, and also including a computer cable having a plug connectable to the laptop computer and having a plug connectable to the patient monitoring module.

5. The medical system of claim **4**, wherein the first panel includes a pocket on a back side of the first panel for holding the battery unit, wherein the first panel includes a pocket on a front side of the first panel for holding the patient monitoring module, and wherein the first panel includes a pocket on the front side of the first panel for holding the patient gas-exchange module.

6. The medical system of claim **5**, wherein the battery unit includes a rechargeable battery and a hand-crank battery recharger.

7. The medical system of claim **3**, also including a patient drug delivery module and a second inter-module connecting cable, wherein the patient drug delivery module is held by the first panel and is operatively connectable to a patient to deliver a drug to the patient, wherein the second inter-module connecting cable is affixed to the backpack pouch, has a plug connected to the patient drug delivery module, and has a plug connected to the patient gas-exchange module, wherein the battery is adapted to power the patient drug delivery module, wherein the laptop computer is operatively connectable to the patient drug delivery module through the patient gas exchange module and the patient monitoring module, and wherein the laptop computer is adapted to control the patient drug delivery module to control a flow rate of the drug to the patient for a predetermined medical procedure using the data from at least a plurality of the ECG, SpO_2, blood pressure, and CO_2 monitoring medical units.

8. The medical system of claim **7**, wherein the second panel includes a pocket for holding the laptop computer, and also including a computer cable having a plug connectable to the laptop computer and having a plug connectable to the patient monitoring module.

9. The medical system of claim **8**, wherein the first panel includes a pocket on a back side of the first panel for holding the battery, wherein the first panel includes a pocket on a front side of the first panel for holding the patient monitoring module, wherein the first panel includes a pocket on the front side of the first panel for holding the patient gas-exchange module, and wherein the first panel includes a pocket on the front side of the first panel for holding the drug delivery module.

10. The medical system of claim **9**, wherein the drug has at least one medical effect on the patient chosen from the group consisting of a sedative effect and an analgesic effect.

* * * * *

patsnap

专利名称(译)	医疗系统包括背包袋		
公开(公告)号	US20100010321A1	公开(公告)日	2010-01-14
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[标]申请(专利权)人(译)	伊西康内外科公司		
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摘要(译)

一种医疗系统包括适于由人携带的折叠背包袋，患者监测模块和适于显示由患者监测模块测量的生理参数的膝上型计算机。患者监测模块和膝上型计算机由袋的相应的第一和第二面板保持。