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(54) **INFANT PATIENT TRANSFER DEVICE
WITH TEMPERATURE SENSOR**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,462,897 A * 7/1923 Barto A47D 13/02
294/140
D109,371 S * 4/1938 Friedman D2/719
D132,469 S * 5/1942 Murphy 2/69
2,358,410 A * 9/1944 Matthesius A41B 13/06
2/69.5

(Continued)

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A61G 1/01 (2006.01)

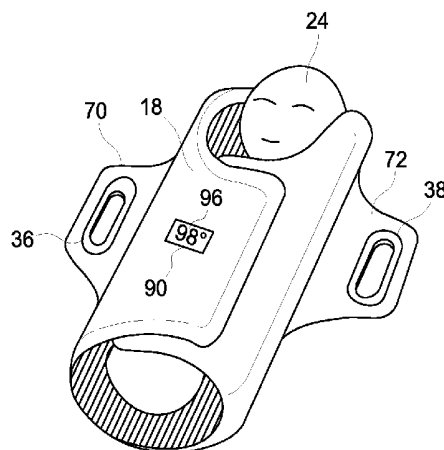
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(57) **ABSTRACT**

A patient transfer device is utilized to transport infant patients between locations within a hospital environment. The patient transfer device includes a center, support section and a pair of side sections that can be moved into contact with each other to surround the infant patient. The first and second side sections each include a handle that can be brought into close proximity to each other and can be grasped by a single hand of a clinician. The patient transfer device includes a temperature sensor positioned to provide a temperature measurement of the patient when the patient is received on the patient transfer device. The patient temperature can be displayed on either an integrated display or wirelessly transmitted to an external display device. In this manner, the temperature of the infant can be continuously monitored during transport.

9 Claims, 4 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

2,804,249	A *	8/1957	Manalo	A47D 13/02 224/158
3,739,399	A *	6/1973	Sheahon	A41B 13/06 2/69.5
D269,658	S *	7/1983	Bor	5/413 R
4,747,413	A *	5/1988	Bloch	A41B 13/00 128/903
5,073,688	A *	12/1991	McCormack	H05B 3/342 219/212
5,333,769	A *	8/1994	Skroski	A47D 5/006 224/148.5
5,369,804	A *	12/1994	Metcalf	A41D 11/00 2/69
5,432,965	A *	7/1995	Espinoza	A47D 13/02 5/482
5,692,257	A *	12/1997	Albertieri	A41B 13/06 5/494
5,759,149	A *	6/1998	Goldberg	A61G 11/00 600/22
6,450,168	B1 *	9/2002	Nguyen	A41D 13/1272 128/869
6,662,390	B1 *	12/2003	Berger	A41B 13/06 2/69
D510,792	S *	10/2005	Vazquez	D2/718
7,574,750	B2 *	8/2009	Harris	A41B 13/005 2/69.5
7,809,420	B2 *	10/2010	Hannula	A61B 5/14552 600/340
8,191,188	B2 *	6/2012	Kaplan	A47D 15/008 2/69.5
8,430,451	B1 *	4/2013	Heinz	B60N 2/5685 297/180.12
8,671,486	B1 *	3/2014	Paperno	A41B 13/06 2/69.5
9,032,572	B1 *	5/2015	Leach	A47D 15/003 5/655
9,332,791	B1 *	5/2016	Bush	A41D 11/00
2002/0032361	A1 *	3/2002	Eustace	A61G 11/00 600/22
2004/0019303	A1 *	1/2004	Thomson	A61B 5/103 600/595
2004/0187184	A1 *	9/2004	Rubin	A41D 27/085 2/69
2005/0122564	A1 *	6/2005	Zehner	G06K 7/1095 359/296
2008/0122616	A1 *	5/2008	Warner	A61B 5/0002 340/541
2008/0173629	A1 *	7/2008	Deibel	A61F 7/007 219/212
2008/0313812	A1 *	12/2008	Reeves	A47D 13/02 5/655
2009/0099630	A1 *	4/2009	Augustine	A61F 7/0097 607/96
2009/0099631	A1 *	4/2009	Augustine	A61F 7/007 607/104
2009/0131165	A1 *	5/2009	Buchner	A63F 13/02 463/30
2009/0284164	A1 *	11/2009	Ray	G09G 3/14 315/218
2011/0021886	A1 *	1/2011	Briggs	A61B 5/01 600/301
2011/0224760	A1 *	9/2011	Potter	A61F 7/0097 607/104
2012/0280543	A1 *	11/2012	Moussa	A47C 31/10 297/184.13
2013/0036536	A1 *	2/2013	Breindahl	A41B 13/06 2/455
2013/0340770	A1	12/2013	Starr et al.	
2014/0137324	A1 *	5/2014	Doering	A47D 7/04 5/93.1
2015/0045608	A1 *	2/2015	Karp	A47D 15/008 600/28
2015/0066119	A1 *	3/2015	Panicker	A61F 7/0097 607/104
2015/0128350	A1 *	5/2015	Paperno	A47G 9/083 5/655
2015/0238138	A1 *	8/2015	Lehmann	A61B 5/7405 600/301
2015/0279172	A1 *	10/2015	Hyde	G06Q 10/10 340/815.4
2015/0286346	A1 *	10/2015	Liu	G06F 3/0482 715/765
2015/0313474	A1 *	11/2015	Goto	A61B 5/0008 600/549
2016/0016001	A1 *	1/2016	Loupis	A61N 5/062 604/20

* cited by examiner

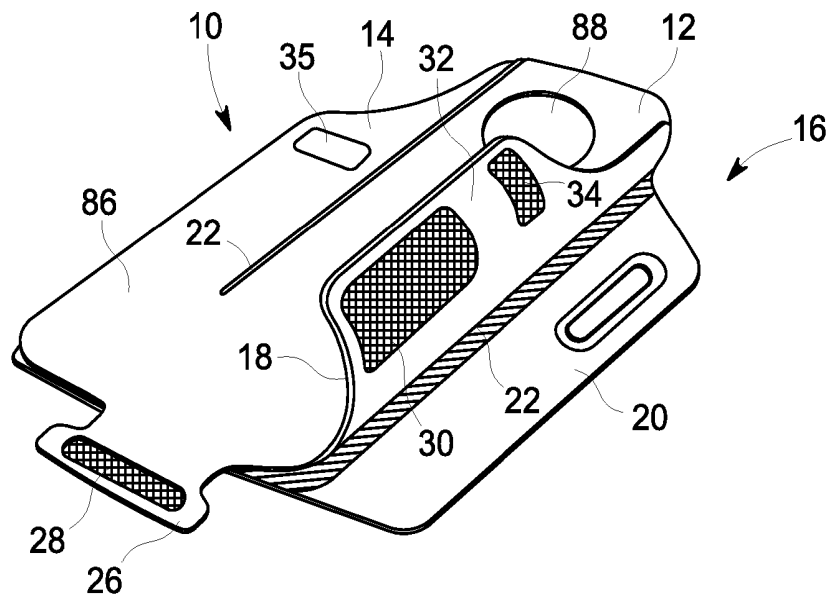


FIG. 1

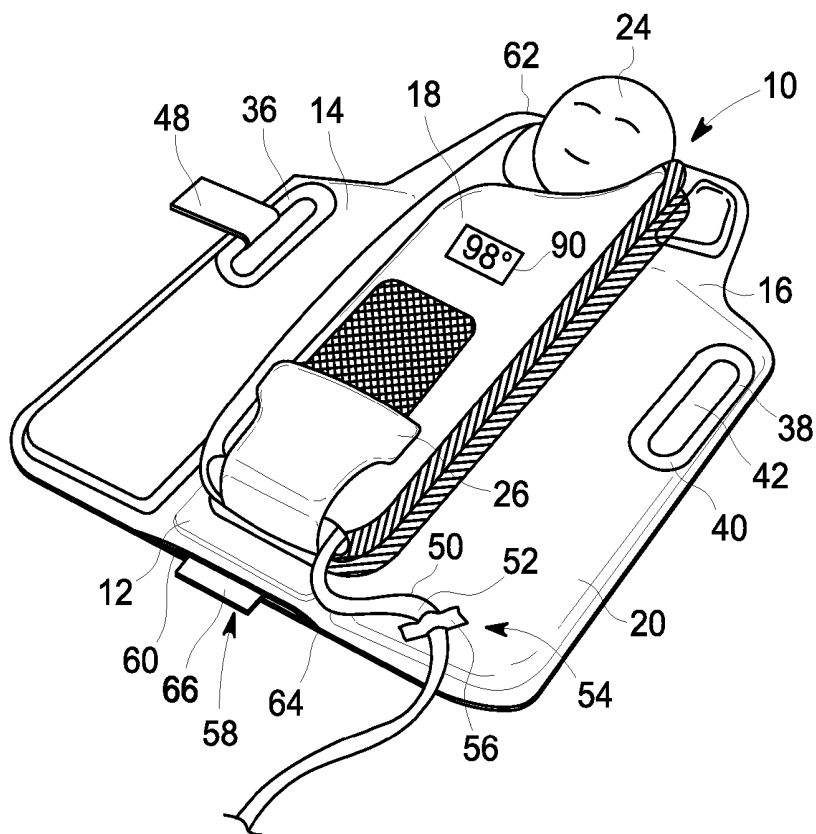


FIG. 2

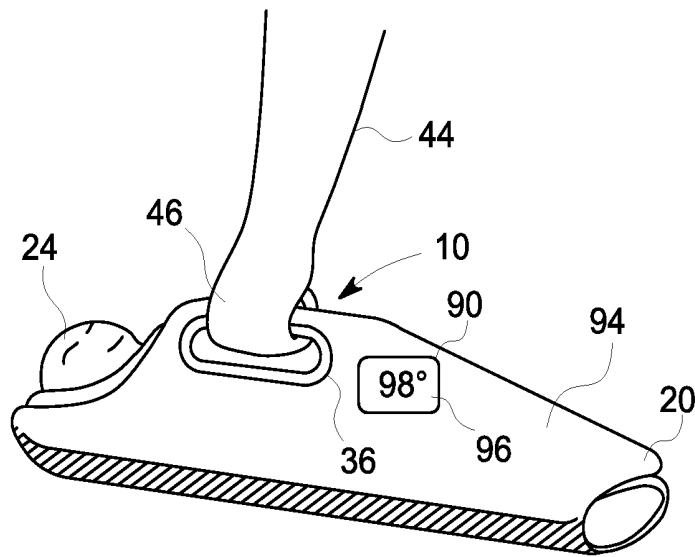


FIG. 3

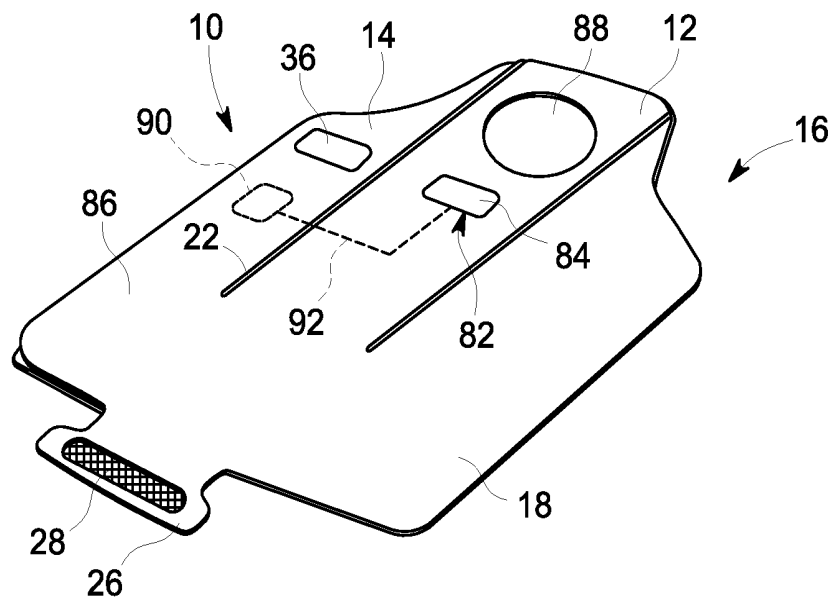


FIG. 4

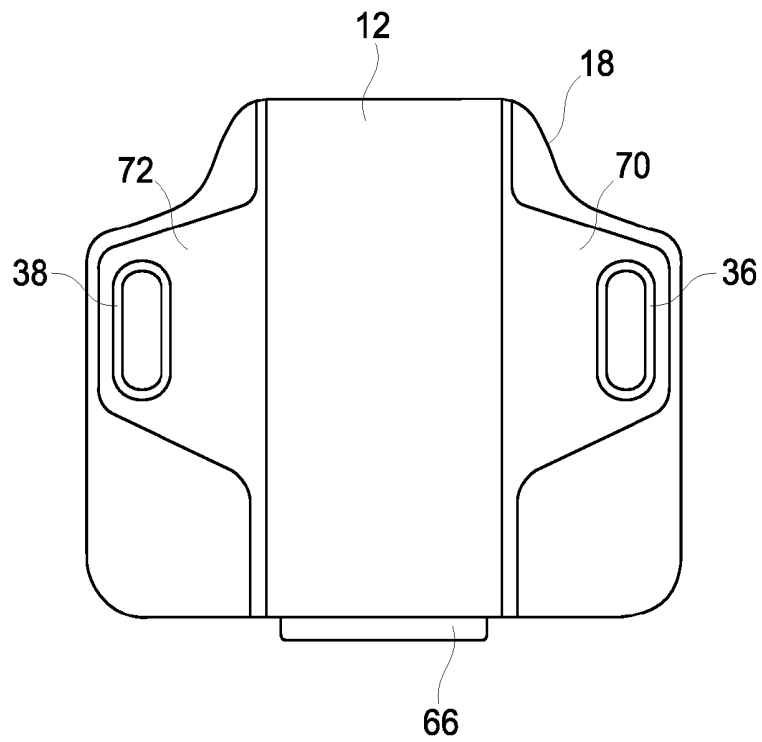


FIG. 5

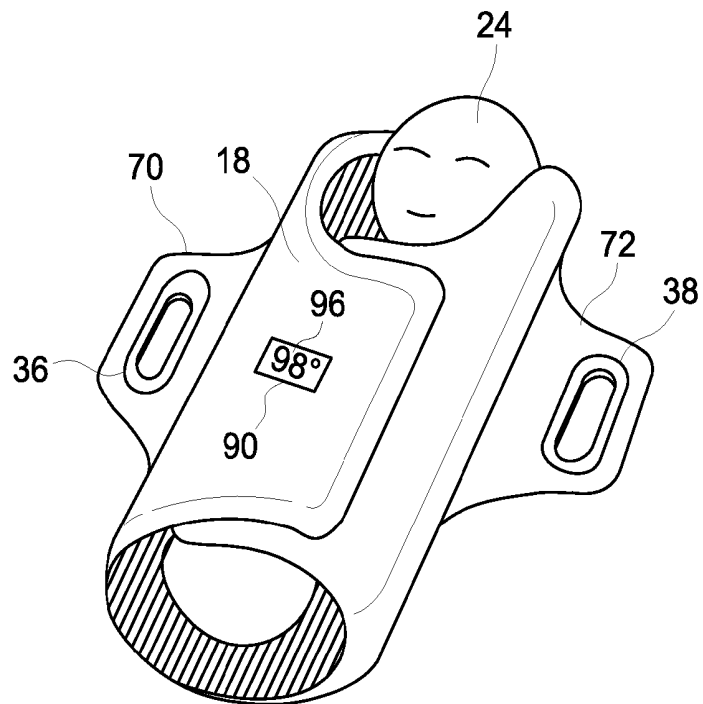


FIG. 6

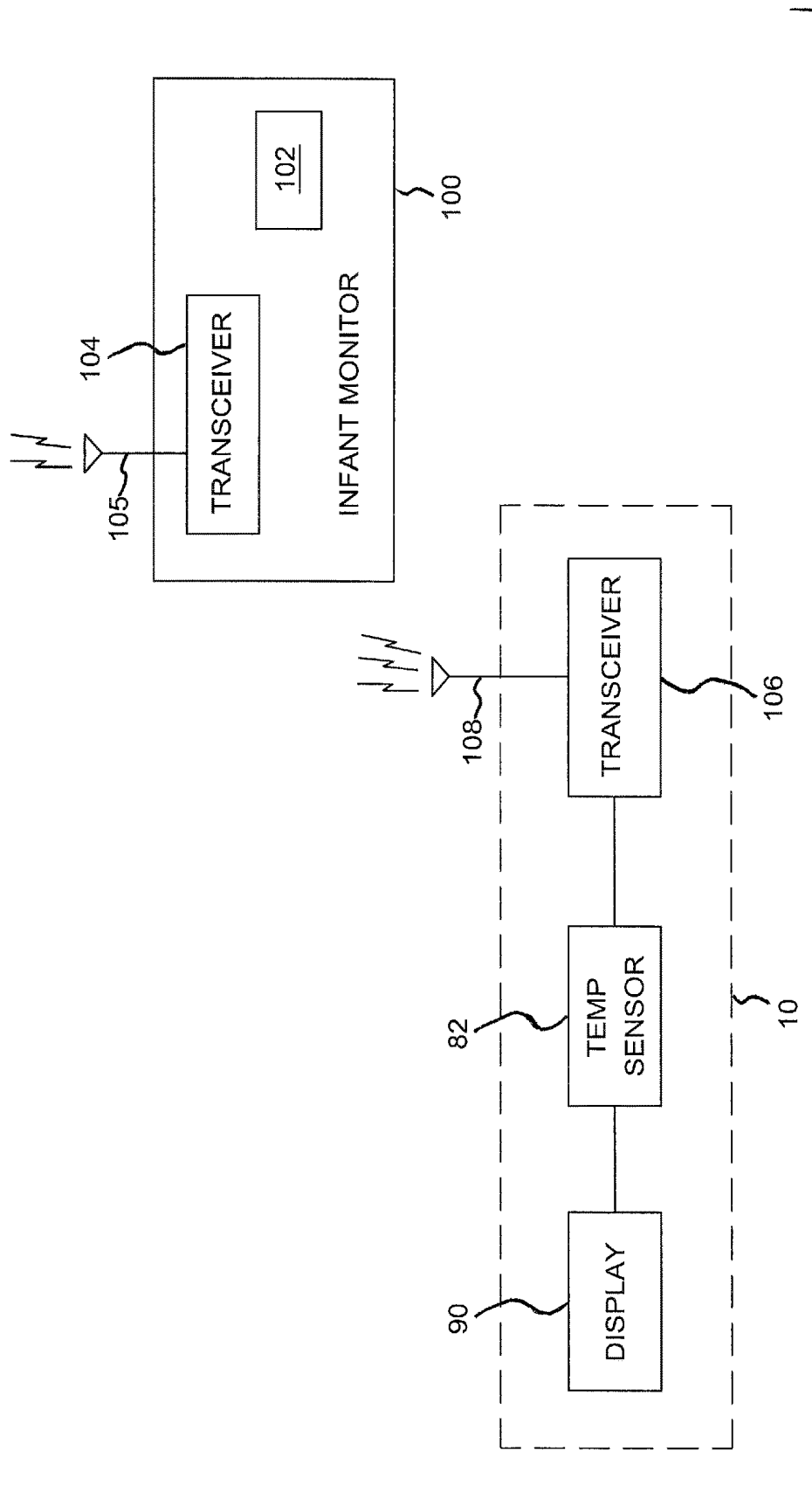


FIG. 7

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INFANT PATIENT TRANSFER DEVICE WITH TEMPERATURE SENSOR

BACKGROUND

The present disclosure generally relates to a device for moving an infant patient. More specifically, the present disclosure relates to an infant patient transfer device (sling) that can be used to support an infant patient during movement while providing a temperature reading from the infant when the infant is within the patient transfer device.

Presently, the standard practice used to transfer an infant patient out of an incubator or bed is for a nurse or other care physician to carefully slide a hand (or two) under the infant patient and manually lift the patient. When the nurse physically contacts the infant patient, the patient is often stimulated which, in high risk patients, can introduce unwanted stress to the infant patient. In addition, when a nurse lifts the infant patient, there is an increased risk of the nurse snagging one or more of the multiple lines connected to the patient (IV, EKG leads, ET tube, etc.). The possibility of snagging or disconnecting tubes connected to the infant patient can increase the risk to the infant patient during the lifting procedure.

In order to address these problems, a patient transfer device, such as shown in U.S. Patent Publication No. 2013/0340770 was developed. When a patient is received within the infant patient transfer device, the patient is securely held in place for transport. Currently, there is a trend to delay clamping of the umbilical cord after the baby has been born. In such situations, the infant may be held within the patient transfer device for between one and ten minutes. While the infant is within the patient transfer device, there is no monitoring of the patient vital signs. Once the infant is transported to an infant warmer, patient bed or incubator, sensors are applied to the patient to begin monitoring vital signs.

SUMMARY

The present disclosure relates to a patient transfer device for moving an infant patient. The patient transfer device securely holds the patient and includes a temperature sensor that detects the temperature of the infant for display either on the patient transfer device or at a remote display.

The patient transfer device includes a center support section that is positioned beneath the patient. First and second side sections are each connected to the center support section. The first side section includes a first handle while the second side section includes a second handle. When an infant patient is supported on the center support section, the first and second side sections can be moved upward and toward each other such that the first and second handles are positioned in close proximity to each other. When the first and second handles are positioned in close proximity to each other, the clinician can grasp both of the first and second handles with a single hand to move the patient while the patient is supported by the patient transfer device.

The patient transfer device further includes a stiffening device that can be positioned within the center support section to provide rigid support for the infant patient during movement. In one embodiment of the disclosure, the stiffening device is a backboard that is received within a pocket formed in the center support section. The backboard can be selectively removed and inserted onto the center section as needed and desired. The backboard preferably extends along a longitudinal axis, wherein the backboard is flexible along

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the longitudinal axis and rigid in a direction transverse to the longitudinal axis. The rigid nature of the backboard supports the patient's spine during movement while allowing the first and second side sections to move toward each other to securely envelope the patient during transport.

The patient transfer device may further include a hold down device positioned on one of the first and second side sections. The hold down device receives and retains the wires and tubes connected to the patient such that the wires and tubes are securely retained during transport of the patient. Various types of hold down devices are contemplated as being within the scope of the present disclosure. One embodiment includes a section of material that can be connected to the second side section to hold the tubes and wires in place.

The patient transfer device may further include a temperature sensor positioned within the center support section. The temperature sensor is designed to sense the temperature of an infant when the infant is supported along the center support section. In one embodiment of the disclosure, the temperature sensor is designed to directly contact the infant's skin to obtain a temperature measurement. In another contemplated embodiment, the temperature sensor is a radiant sensor that detects the heat radiated from the infant to generate a temperature measurement. In yet another alternate embodiment, the temperature sensor includes a thermochromic material that changes colors based upon the temperature of the infant.

The patient transfer device can further include an integrated display that receives a temperature signal from the temperature sensor. The integrated display on the patient transfer device displays the sensed temperature, which allows a caregiver to monitor the temperature of the infant when the infant is supported on the patient transfer device. The integrated display can be designed to indicate the temperature of the baby while the baby is either resting upon the center section or being carried by a caregiver.

In addition to including an integrated display, the patient transfer device can be configured to include a wireless transmitter to transmit temperature signals to a remote display. The wireless transmitter can be configured to transmit information to a remote display, such as on an infant warmer, incubator or other type of infant bed. In this manner, the patient transfer device can be positioned within the infant bed and continuously transmit temperature information to the infant bed.

Various other features, objects and advantages of the invention will be made apparent from the following description taken together with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawings illustrate the best mode presently contemplated of carrying out the disclosure. In the drawings:

FIG. 1 is a front perspective view of a first embodiment of a patient transfer device of the present disclosure;

FIG. 2 is a front perspective view of the first embodiment of the patient transfer device with an infant supported on the device;

FIG. 3 is a view illustrating the use of the transfer device to move an infant patient;

FIG. 4 is a front perspective view similar to FIG. 1 illustrating the position of one embodiment of a temperature sensor and an integrated display;

FIG. 5 is a back view of an alternate embodiment of the patient transfer device;

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FIG. 6 is a view of the alternate embodiment of the patient transfer device used to support an infant patient;

FIG. 7 is a schematic illustration showing the communication between the temperature sensor, integrated display and a remote display utilizing a wireless transmission device.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 illustrates a patient transfer device 10 of the present disclosure. The patient transfer device 10 can be used to transfer an infant patient from one location to another while minimizing the physical contact between the clinician and the patient while providing secure support for the patient during movement.

As illustrated in FIG. 1, the patient transfer device 10 includes a center section 12, a first side section 14 and a second side section 16. In the embodiment illustrated in FIG. 1, the patient transfer device includes an inner liner 18 and an outer liner 20 that each form portions of the center side sections. Although an inner liner 18 and an outer liner 20 are shown as separate components in FIG. 1, it should be understood that the inner and outer liners 18, 20 could be combined as a single layer that forms the center section 12 and the first and second side sections 14, 16. In the embodiment shown in FIG. 1, the inner liner 18 is formed from a soft, foam material and is joined to the outer liner 20 along a pair of spaced attachment lines 22. The outer liner 20 can be formed from a slightly more rigid and durable material as compared to the inner liner 18. As illustrated in FIG. 2, an infant patient 24 can be placed on the inner liner 18 and the opposite sides of the inner liner 18 that forms a portion of the side sections folded over the patient 24 to surround the patient as illustrated.

In the embodiment shown in FIG. 1, the inner liner 18 includes an extended end portion 26 that includes an end fastener 28. When the patient is supported on the inner liner as shown in FIG. 2, the end fastener 28 formed as part of the end portion 26 is received along, a second fastener 30. In the embodiment shown in FIGS. 1 and 2, the fasteners 28, 30 are opposite portions of a hook and loop fastener, such as Velcro®. The physical engagement between the fasteners 28, 30 allows the end portion 26 to fold the inner liner 18 in the condition shown in FIG. 2. Although a hook and loop fastener are shown in the embodiment of FIGS. 1 and 2, it should be understood that different types of fasteners could be utilized while operating, within the scope of the present disclosure. Alternatively, the end portion 26 could be eliminated while also operating within the scope of the present disclosure.

Referring back to FIG. 1, the fastener 30 is secured to an inner surface 32 of the inner liner 18 and is exposed only after the second side section of the inner liner is wrapped around the infant patient. In addition to the fastener 30, an upper fastener portion 34 is also positioned along the inner surface 32. The upper fastener portion 34 is engaged by a mating fastener 35 formed along the first side section 14 of the inner liner 18. The fasteners 34, 35 can also be mating portions of a hook and loop fastener, such as Velcro®. The fasteners 34, 35 aid in holding the first and second side sections of the inner liner 18 in the condition shown in FIG. 2. Although hook and loop fasteners are shown in the embodiment of FIGS. 1 and 2, it should be understood that other types of fasteners could be utilized while operating within the scope of the present disclosure.

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As illustrated in FIG. 2, the portion of the outer liner 20 that forms a portion of the first side section 14 includes a first handle 36 while the portion of the outer liner 20 that forms a portion of the second side section 16 includes a second handle 38. In the embodiment shown in FIG. 2, the first and second handles 36, 38 are formed only in the outer liner 20 and are defined by a plastic outer housing 40 that forms an open interior 42.

As can be seen in FIG. 3, when the infant patient 24 is supported along the transfer device 10, a clinician 44 can grasp the pair of handles 36, 38 with a single hand 46 and lift the infant patient for transport and movement. As can be understood in FIGS. 2 and 3, the first and second side sections 14, 16 are sized such that the first and second handles 36, 38 are located close enough to each other to facilitate grasping of the entire patient transfer device 10 by the single hand 46.

Referring back to FIG. 2, in the embodiment illustrated, a strap 48 can be attached to one of the first and second handles 36, 38 and used to secure the handles together during transport of the patient 24. Although a flexible strap 48 is shown in FIG. 2, various other types of straps could be utilized while operating within the scope of the present disclosure. Alternatively, the strap 48 could be eliminated.

As illustrated in FIG. 2, a series of tubes 50 and wires 52 are often attached to the patient 24 that needs to be transported. Since the wires and tubes 50, 52 are often inserted into the patient or connected at specific locations on the patient, it is desirable not to disrupt the tubes and wires during movement. Thus, a need exists for some type of hold down device to prevent the tubes and wires from being disconnected from the patient 24 during transport. In the embodiment shown in FIG. 2, a hold down device 54 is formed on one of the first and second side sections 14, 16 of the transport device. In the embodiment of FIG. 4, a section of adhesive tape 56 is attached to the inner surface of the outer liner 20 in the second side section 16. Although adhesive tape 56 is shown in FIG. 2, other types of hold down devices 54 are contemplated as being within the scope of the disclosure. For example, the hold down device 54 could be a section of a hook and loop fastener, a strap with a button on snap, a section of flexible material or any other type of device that could be utilized to hold the tubes and wires 50, 52 in a secure position as illustrated.

In the embodiment shown in FIG. 2, a stiffening device 58 is shown inserted into a pocket 60 formed in the center section 12 of the patient transfer device 10. The stiffening device 58 typically extends the entire length of the center section 12 from the first end 62 near the patient's head to a second end 64 near the feet of the patient. The stiffening device 58 provides the required stiffness for the patient transfer device 10 such that when the patient transfer device 10 is used to support the patient, the stiffening device 58 prevents the first and second side sections 14, 16 from collapsing onto the patient 24. Additionally, the stiffening device 58 provides the required stiffness for the transfer device 10 such that the transfer device and the patient do not collapse in the longitudinal direction between the first end 62 and the second end 64.

In the embodiment shown in FIGS. 1 and 2, the stiffening device 58 is a backboard that is received within the pocket 60 and extends the entire length of the patient transfer device 10 from the first end 62 to the second end 64. The backboard 66 is preferably formed from a plastic material that has the required stiffness, durability and size to provide the required support for the infant patient 24. Although plastic is described as being the most preferred material for the

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backboard 66, it is contemplated that other materials could be utilized while operating within the scope of the present disclosure.

Alternatively, the removable stiffening device 58 and sewn-in pocket 60 could be replaced with other types of stiffening devices. As an example, a series of inflatable tubes could be formed within the center section 12 and selectively inflated/deflated depending upon whether the patient 24 is on the transfer device 10 and needs to be moved. Various other types of stiffening devices are also contemplated as being within the scope of the present disclosure. The use of the stiffening device 58 is contemplated as being valuable to provide secure and stable support for the infant patient 24 during movement.

FIG. 5 illustrates a second embodiment of the patient transfer device 10 of the present disclosure. In the second embodiment shown in FIG. 5, the stiffening device 58 is also a backboard 66 that can be moved into and out of a pocket formed in the center section 12. In the embodiment shown in FIG. 5, the first side section 14 includes the inner liner 18 and a smaller, outer liner 70. Likewise, the second side section 16 includes the inner liner 18 and smaller, outer liner 72. The outer liners 70, 72 include the first and second handles 36, 38 as in the first embodiment shown in FIGS. 1-2.

As illustrated in the back view of FIG. 5, the outer liner sections 70, 72 are joined to the center section 12. As in the first embodiment, the inner liner 18 is formed from a soft, foam material that provides a comfortable support surface for an infant patient when the infant patient is supported on the inner liner 18. As illustrated, in FIG. 6, the patient 24 is supported along the center section and the inner liner of both the first and second side sections are wrapped around the patient 24. Although not illustrated, it is contemplated that various types of fastening devices and materials could be utilized to hold the opposite sides of the inner liner 18 in place as shown. When the patient 24 is wrapped within the inner liner 18 as illustrated, the outer liner sections 70, 72 of the first and second side sections can be brought together such that a single hand 46 of the clinician 44 can be used to grasp both handles.

As shown in FIG. 4, the patient transfer device 10 further includes a temperature sensor 82 that is positioned within the center section 12. In the embodiment shown in FIG. 4, the temperature sensor 82 is a contact sensor that is positioned on the surface of the inner liner 18. The contact temperature sensor 82 includes a patch 84 that is positioned to contact the skin of the infant when the infant is positioned on the patient transfer device 10. Since the infant will be securely held in place as shown in FIG. 2, the contact patch 84 will maintain direct skin contact with the infant when the infant is supported on the center section 12. Although the temperature sensor 82 is shown located in the center section 12, the temperature sensor 82 could be positioned in other locations, such as in or on one of the side sections of the inner liner 18.

In the embodiment shown in FIG. 4, the temperature sensor 82 is connected to a display device 90 through a communication line 92. It is contemplated that the communication line 92 could pass beneath or through the inner liner 18 and provide wired communication between the temperature sensor 82 and the display device 90. Alternatively, the temperature sensor 82 and display 90 could be configured to communicate with each other using various different types of wireless communication protocols. The use of a wired connection will decrease the cost and complexity of both the temperature sensor 82 and the display device 90.

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In the embodiment shown in FIG. 3, the display device 90 is viewable from an outer surface 94 of the outer liner 20. In the embodiment illustrated in FIG. 3, the integrated display device 90 includes an LCD display configured to show at least the sensed temperature 96 of the infant. Thus, when the infant is being carried as shown in FIG. 3, a caregiver can view the display device 90 and determine the temperature of the infant 24.

In a contemplated, alternate embodiment, the display device 90 could be positioned on the inner liner 18 and thus be viewable when the infant is secured as shown in FIG. 2. In either case, the integrated display device 90 allows the caregiver to visually view the temperature of the infant as determined by the temperature sensor 82.

In the alternate configuration shown in FIG. 6, the display device 90 is integrated into the inner liner 18 and is viewable by the caregiver when the baby is supported on the center section and wrapped securely by the overlapping inner liners 18.

In the embodiment shown in the drawing figures, the temperature sensor 82 is a contact sensor that physically contacts the skin of the infant. In a contemplated, alternate embodiment, the temperature sensor 82 could be an infrared sensor positioned within the center section to detect the temperature of the infant. In an embodiment in which the temperature sensor is an infrared sensor, the sensor would not need to contact the skin of the patient and instead could be positioned only in close proximity with the patient.

In yet another alternate embodiment, it is contemplated that the inner liner 18 could include a section of thermochromic material that would change colors within a temperature range of the infant. The section of thermochromic material would need to be visible to the caregiver such that the caregiver could determine the temperature of the infant based upon the color of the thermochromic material. In one contemplated embodiment, a strap of thermochromic material could be placed in direct contact with the infant and be viewable when the infant is wrapped within the inner liner, as shown in FIG. 2, or when being carried as shown in FIG. 3. In each case, the temperature sensor would provide an indication to the caregiver as to the temperature of the infant when the infant is supported on the patient transfer device.

FIG. 7 is a schematic illustration showing the possible types of communication from the temperature sensor 82 to either the display 90 contained within the patient transfer device 10 or an infant monitor 100 located remotely from the patient transfer device 10, or both. It is contemplated that the infant monitor 100 could be included in various different types of infant care devices that include monitors, such as a radiant warmer, incubator, or an infant bed. The infant monitor 100 preferably includes a display 102 that can be used to display various different types of monitored physiological parameters from the infant. As an example, when an infant is placed within a radiant warmer, sensors are connected to the infant to monitor the infant's heart rate, temperature and overall weight. Each of these monitored parameters is shown on the display 102.

The infant monitor 100 is shown as including a wireless transceiver 104 and an antenna 105 that can send and receive wireless signals, such as from a transceiver 106 contained within the patient transfer device 10. The transceiver 106 includes an antenna 108 that allows the transmitter to send wireless signals for receipt by the infant monitor. It is contemplated that the wireless signals could be sent utilizing various different types of wireless protocols, such as but not limited to Blue Tooth or ZigBee. The inclusion of the wireless transceiver 106 in the patient transfer device 10

allows the temperature sensor **82** to continue to monitor the infant temperature and relay the signals to the infant monitor **100** when the patient transfer device **10** is positioned within the patient bed including the monitor **100**. Although both the patient transfer device **10** and infant monitor **100** are described as including multi-directional transceivers, it is contemplated that the patient transfer device could only include a transmitter and infant monitor only include a receiver.

Referring back to FIGS. **1** and **2**, the method of utilizing the patient transfer device **10** of the present disclosure will now be described. Although the present method is being described as one preferred method of utilizing the patient transfer device **10**, it should be understood that the patient transfer device **10** could be utilized in different ways depending upon the clinician requirement and the desired amount of movement necessary for the patient **24**.

Initially, the patient transfer device **10** is positioned within an incubator or patient bed before the patient is placed within the incubator or bed. It is contemplated that the patient transfer device **10** could be placed in an incubator in situations in which the patient will be moved frequently by the clinician.

Once the patient transfer device **10** is placed within the incubator, the patient is placed on the outer surface **86** of the inner liner **18** in the center section **12**. In the embodiment illustrated, the inner liner **18** includes both the temperature sensor **82** and a headrest **88** that includes additional cushioning for the patient's head. However, the headrest **88** could be eliminated while operating within the scope of the present disclosure.

When the infant is positioned on the center section **12**, the temperature sensor **82** begins to detect the temperature of the infant. The detected temperature from the temperature sensor **82** is relayed to the integrated display device **90** where the temperature is continuously displayed to the caregiver. If the patient transfer device **10** is positioned near the infant monitor **100** shown in FIG. **7**, the transceiver **106** will transmit the temperature reading to the infant monitor **100** for display on the infant monitor display **102**. If the patient transfer device is not close enough to the infant monitor **100**, the transmission of the temperature will not be relayed to an external monitor. The sensed temperature of the infant will be continuously displayed on the display device **90** for viewing by the caregiver.

In one contemplated embodiment, the display device could include upper and lower temperature thresholds that are preset into the display device. If the sensed temperature of the infant either exceeds the upper temperature threshold or falls below the lower temperature threshold, the display device could be configured to generate some type of alarm indication. Such alarm indication could be a change of color of the display, an audible warning, a flashing display or any other type of indicator that would provide a visual indication or audio indication to the caregiver that the temperature of the infant has fallen below or above the temperature thresholds.

When it is desired to move the patient **24**, the clinician initially installs or activates the stiffening device **58** within the center section **12**. In the embodiment shown in FIG. **2**, the stiffening device **58** is a backboard **66** which is inserted into the open pocket **60** formed in the center section **12**. Although a backboard **66** is shown in the embodiment, other types of stiffening devices could be utilized while operating within the scope of the present disclosure. It is desirable that

the stiffening device **58** can be selectively removed to increase the comfort of the patient **24** if simply resting within a bed or incubator.

As described previously, it is desired that the backboard **66** be inflexible in a direction transverse to the lengthwise, longitudinal axis of the backboard **66**. The rigid, inflexibility of the backboard **66** in a direction transverse to the longitudinal axis provides additional support for the back and spine of the patient during transport. However, it is also desirable that the backboard **66** be somewhat flexible toward the longitudinal axis so that when the first and second side sections are lifted over the patient, the backboard slightly flexes to increase the comfort for the patient.

Once the stiffening device **58** has been positioned in the center section **12**, the inner layer that defines the first side section **14** is folded upward and into contact with the patient. Once in place, the portion of the inner layer defining the second side section **16** is folded into contact with the opposite side of the inner layer and the first and second fasteners **34**, **35** engage each other to hold the inner layer in the condition shown in FIG. **2**.

Once the first layer is folded into the condition shown in FIG. **2**, the end portion **26** is folded upward into contact with the fastener **30**. At this time, the wires and tubes leading from the patient are securely attached to the second side section **16** utilizing the hold down device **54**. Although the hold down device **54** is shown positioned on the second side section **16**, it should be understood that the hold down device **54** could also be on the first side section **14** or a separate hold down device included on each of the first and second side sections **14**, **16**.

Once the wires and tubes **50**, **52** have been secured by the hold down device **54**, the first and second side sections **14**, **16** are brought upward toward each other until the first handle **36** and the second handle **38** are positioned near each other. Once the first and second handles are positioned near each other, the handles can be grasped by a single hand **46** of the clinician, as shown in FIG. **4**.

When the first and second handles are positioned as shown in FIG. **3**, the display **90** can still be viewed by the caregiver during transport of the infant. The second embodiment shown in FIG. **6** also provides a display **90** that can be viewed by the caregiver when the infant is being transported. In this manner, the caregiver can continuously keep an eye on the temperature of the infant as the infant is carried from one location to another.

This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to make and use the invention. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they have structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal languages of the claims.

We claim:

1. A transfer device configured to support an infant patient during transfer of the infant patient, comprising:
 - a temperature sensor configured to monitor the infant patient's temperature during transfer;
 - a center support section positionable beneath the infant patient;
 - a first side section connected to the center support section, the first side section including a first handle;
 - a second side section connected to the center support section, the second side section including a second

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- handle, wherein the first and second side sections are movable between an unfolded condition in which the first section, the second section and the center section are generally co-planar and a folded condition in which the first and second side sections are folded toward each other and over the center section and the infant patient when the infant patient is on the center section, wherein the first and second handles are located adjacent to each other in the folded condition such that the first and second handles are used to lift the transfer device and the infant patient during transfer of the infant patient; and
- a display integrated into the transfer device, wherein the display is in communication with the temperature sensor to numerically display the infant patient's temperature during transfer.
2. The transfer device of claim 1 wherein the temperature sensor is positioned within the center support section and configured to directly engage the infant patient's skin.
3. The transfer device of claim 1 wherein the display is configured to communicate a visual alert when the infant patient's temperature falls outside of a predefined range.
4. The transfer device of claim 1 further comprising a wireless transmitter operatively connected to the temperature sensor.
5. The transfer device of claim 1 wherein the display is integrated into one of the first and second side sections.
6. The transfer device of claim 1 further comprising a stiffening device positioned within the center support section to provide support for the infant patient during movement.
7. A transfer device configured to support an infant patient during transfer of the infant patient, comprising:

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- a temperature sensor configured to monitor the infant patient's temperature during transfer;
- a center support section positionable beneath the infant patient;
- a first side section connected to the center support section, the first side section including a first handle;
- a second side section connected to the center support section, the second side section including a second handle, wherein the first and second side sections are sized to surround the infant patient when the first side section is folded over the center section along the connection between the first side section and the center section and the second side section is folded over the center section along the connection between the second side section and the center section such that the first and second side sections are folded over the infant patient when the infant patient is on the center section, wherein the first and second handles are located adjacent to each other such that the first and second handles are used to lift the transfer device and the infant patient during transfer of the infant patient; and
- a display mounted to one of the first and second side sections in communication with the temperature sensor to numerically display the infant patient's temperature during transfer.
8. The transfer device of claim 7 wherein the temperature sensor is positioned within the center support section and configured to directly engage the infant patient's skin.
9. The transfer device of claim 7 further comprising a wireless transmitter operatively connected to the temperature sensor to communicate between the temperature sensor and the display.

* * * * *

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摘要(译)

患者转移装置用于在医院环境内的位置之间运送婴儿患者。患者转移装置包括中心，支撑部分和一对侧部，所述侧部可移动成彼此接触以包围婴儿患者。第一和第二侧部各自包括手柄，该手柄可以彼此靠近并且可以由临床医生的单手抓握。患者转移装置包括温度传感器，该温度传感器定位成当患者被接收在患者转移装置上时提供患者的温度测量。患者体温可以在集成显示器上显示或无线传输到外部显示设备。以这种方式，可以在运输期间连续监测婴儿的温度。

