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SOLAR AIR STROLLER

Abstract

A stroller includes a frame having a shaft, a seat depending from the frame, a base disposed on the frame, and wheels disposed on the base. The shaft of the frame is inserted into the base to allow the frame to rotate relative to the base. In another possible approach, a stroller includes a frame, a seat depending from the frame, a base disposed on the frame, a canopy extending from the seat, and a display device incorporated into the canopy. The display device is viewable from the seat and display entertainment and educational content based on signals received from an app on a mobile device.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS [0001] This patent application is a Continuation of U.S. patent application Ser. No. 17/453,372 filed on Nov. 3, 2021. U.S. patent application Ser. No. 17/453,372 claims priority to and all advantages of, U.S. Provisional Patent Application No. 63/109,245 filed on Nov. 3, 2020 and U.S. patent application Ser. No. 63/136,116 filed on Jan. 11, 2021, the contents of both of which are incorporated herein by reference in their entireties.

BACKGROUND
[0002] Strollers make it easy for parents to transport children, especially when the alternative is to carry the child a long distance or walk at a slow pace. It is common to see parents pushing children in strollers at grocery stores, parks, malls, zoos, playgrounds, and other places. Beyond making it easy to transport children, strollers often have storage compartments that parents can use to transport a diaper bag and other personal items.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
[0003] FIG. **1** illustrates an example stroller with features that improve the comfort of the stroller to a child.
[0004] FIG. **2** is a side view of the stroller of FIG. **1** showing a swivel feature and wheel locks.
[0005] FIG. **3** is an inside view of a canopy of the stroller of FIG. **1** having a cooling fan.
[0006] FIG. **4** is a side view of the canopy of FIG. **3** showing the cooling fan and a solar panel.
[0007] FIG. **5** is a perspective view of a stroller having a display device.
[0008] FIG. **6** is a front view of the display device used in the stroller of FIG. **5**.
[0009] FIG. **7** illustrates an example stroller having skis.
[0010] FIGS. **8**A-**8**B illustrates example screenshots of an app that may be used to entertain a child in the stroller.
DETAILED DESCRIPTION
[0011] While strollers make it easy for parents to transport their children, spending extended periods of time in stroller can be uncomfortable for the child. For example, some strollers inhibit airflow, which can make the child feel hot and uncomfortable. Another issue is that the child may experience boredom while riding in the stroller. The lack of comfort or the feeling of boredom may cause some children to become disruptive.
[0012] Another issue with conventional strollers is their inability to adapt to different types of terrain and environments. For many parents, this means having to purchase multiple strollers or limiting use of the stroller to certain activities or locations.
[0013] One way to address these issues is with a stroller that increases child comfort, reduces boredom, and/or is configurable to accommodate different terrains. For instance, a stroller may include a frame having a shaft, a seat disposed on the frame, a base disposed on the frame, and wheels disposed on the base. The shaft of the frame is inserted into the base to allow the frame to rotate relative to the base. In some cases, the base or the wheels may be replaced with skis.
[0014] In another possible approach, a stroller includes a frame, a seat disposed on the frame, a base disposed on the frame, a canopy extending from the seat, and a display device incorporated into the canopy. The display device is viewable from the seat to help educate or entertain a child in the stroller.
[0015] The elements shown may take many different forms and include multiple and/or alternate components and facilities. The example components illustrated are not intended to be limiting.

Indeed, additional or alternative components and/or implementations may be used. Further, the elements shown are not necessarily drawn to scale unless explicitly stated as such.

[0016] FIG. **1** illustrates an example stroller **100** with features that improve the comfort of the stroller **100** to a child, as well as makes the stroller **100** more convenient for adults pushing the stroller **100**. The stroller **100** of FIG. **1** includes a frame **105**, wheels **110**, a seat **115**, a swivel lock **120**, a handlebar **125**, a foot bar **130**, a storage compartment **135**, a wheel lock **140**, and a communication port **145**.

[0017] The frame **105** may generally support other components of the stroller **100**. In some instances, the frame **105** is formed from one or more pieces of metal, plastic, rubber, or materials. For example, the frame **105** may be formed from aluminum, alone or in combination with other materials. As discussed in greater detail below with respect to FIG. **2**, the frame **105** may be mounted to a base **150** in a way that allows the seat **115** to swivel.

[0018] The wheels **110** may attach to the base **150** to facilitate lateral movement of the stroller **100**. The wheels **110** may be circular and formed from plastic or rubber. In some instances, the wheels **110** may attach to axles **155** attached to or integrated into the base **150**. When installed on the axles **155**, the wheels **110** may rotate when the stroller **100** is pushed.

[0019] The seat **115** may be disposed on the frame **105**. The seat **115** may have a generally concave configuration and may be padded for comfort. For instance, the seat **115** may be formed from relatively soft materials such as foam with a cover made from a fabric such as cotton, a synthetic material, or a blend of materials. The cover may be waterproof, removable, and/or machine-washable. The seat **115** may be mounted on the frame **105** above the base **150** so that the seat **115** does not inhibit the frame **105** from rotating about the base **150**.

[0020] The swivel lock **120** may be a mechanical lock that prevents the frame **105** from swiveling relatively to the base **150**. That is, the swivel lock **120** may lock the seat **115** in its orientation relative to the base **150** at the time the swivel lock **120** is engaged. In another possible implementation, the swivel lock **120** may lock the seat **115** in a particular orientation, such as either forward facing, rear facing, or both, when the swivel lock **120** is engaged. The swivel lock **120** may include an actuator that increases pressure between the frame **105** and the base **150**. The increase in pressure may prohibit the frame **105** from rotating relative to the base **150**. For instance, the actuator may include a lever that rotates between a first position and a second position. When in the first position, the lever applies a nominal force to a shaft **160** (see FIG. **2**) extending into the base **150**, thereby allowing the frame **105** and the seat **115** to rotate relative to the base **150**. When in the second position, the lever applies a force to the shaft **160** sufficient to limit rotational movement of the seat **115** relative to the base **150**. Thus, moving the actuator from the first position to the second position may lock the seat **115**.

[0021] A handlebar **125** may be attached to or integrally formed with the frame **105**. In some instances, the handlebar **125** is located at or near the top of the frame **105** to make it easier for a person to push the stroller **100**. The handlebar **125** may further permit rotation of the frame **105** relative to the base **150** when, e.g., the swivel lock **120** is unlocked (e.g., in the first position).

[0022] A foot bar **130** may be located at or near the bottom of the frame **105** or on the base **150**. The foot bar **130** may serve as a footrest or to give the person pushing the stroller **100** additional leverage when pushing the stroller **100** in rough terrain or when slightly tilting the stroller **100** onto an elevated surface such as over a curb to get onto a sidewalk. In some instances, one of the axles **155** may serve as the foot bar **130**.

[0023] The storage compartment **135** (see FIG. **5**) may be attached or integrated into the frame **105**, the base **150**, or the seat **115**. The storage compartment **135** may be used to hold small items. In some instances, the storage compartment **135** is a pouch or pocket. In other instances, the storage compartment **135** includes one or more cup holders, cell phone holders, or the like.

[0024] The wheel lock **140** may be attached or integrated into the base **150** and/or the foot bar **130**. The wheel lock **140** may be actuated to lock one or more of the wheels **110**. In some instances, the

wheel lock **140** includes a lever that, when actuated, prevents one or more wheels **110** from rotating. Therefore, actuating the wheel lock **140** prevents the stroller **100** from moving.

[0025] The communication port **145** may include a device interface such as a universal serial bus (USB) interface. When an electronic device is plugged into the communication port **145**, the electronic device may receive power from a battery **165** (see FIG. **5**) or other power supply located on the frame **105** or the base **150**. Moreover, as discussed in greater detail below with respect to FIG. **5**, the communication port **145** may be used to connect a mobile device, such as a smartphone, to a built-in display device **170** or to power the cooling fan **175** (see FIG. **3**).

[0026] FIG. **2** is a side view of the stroller **100** of FIG. **1** showing how the frame **105** may swivel or rotate relative to the base **150**, as well as additional wheel locks **140** that may be used to lock multiple wheels **110** in place. As shown in FIG. **2**, the frame **105** includes a shaft **160** that extends into the base **150**. The shaft **160** allows the frame **105** to rotate relative to the base **150**. The rotation of the frame **105** causes the seat **115** to rotate since the frame **105** and seat **115** are fixed relative to one another.

[0027] FIG. **3** is an inside view of a canopy **180** of the stroller **100** of FIG. **1** having a cooling fan **175**. The canopy **180** may provide shade while the cooling fan **175** may provide additional comfort to a child in the seat **115**.

[0028] The canopy **180** may be folded into the seat **115** when not in use. When shade or cooling are desired, the canopy **180** may be manually extended or unfolded from a top of the seat **115**. The canopy **180** may be formed from a fabric material, which may or may not be the same material as the seat **115**. In some instances, the canopy **180** may be formed from plastic. The canopy **180** may further or alternatively include structural supports so that the canopy **180** may be cantilevered at least partially over the area where the child is located in the seat **115**. The structural supports may be part of the frame **105** or different from the frame **105**. The canopy **180** may be integrally formed with the seat **115** or otherwise attached to the seat **115** or the frame **105**.

[0029] The cooling fan **175**, incorporated into the canopy **180**, is electrically powered and pushes air toward the child located in the child seat **115**. The cooling fan **175** is powered by an on-board battery **165** (see FIG. **5**), the user's mobile device plugged into the communication port **145**, or another power supply. The cooling fan **175** may include an activation switch. When turned to an ON position, the activation switch may energize a motor that causes the fan to rotate. When turned to an OFF position, the activation switch may disconnect the cooling fan **175** from the battery **165** or other power supply. The cooling fan **175** may include a grill, mesh, or other cover to, e.g., protect the fan blades and to reduce the risk of hair snags, finger injuries, or the like.

[0030] FIG. **4** is a side view of the canopy **180** of FIG. **3**, extending over a portion of the seat **115**, and showing the cooling fan **175** and a solar panel **185**. The solar panel **185** may be used to collect sunlight and charge the on-board battery **165**. In other words, the solar panel **185** converts sunlight into electrical energy that can be stored in the battery **165**.

[0031] FIG. **5** is a perspective view of a stroller **100** having a display device **170** incorporated into the canopy **180**. When the canopy **180** is extended, the display device **170** may be viewable from the seat **115**. That way, the child in the seat **115** may view content presented on the display device **170**. In some possible implementations, the display device **170** is powered by a battery **165** or another type of power supply. When in use, the display device **170** may draw electrical energy from the battery **165**.

[0032] The battery **165** may provide direct current electrical energy to the display device **170** or other devices. The battery **165** may be directly electrically connected to the display device **170**. The battery **165** may be electrically connected to other electronic devices, such as a user's cell phone, through the communication port **145** discussed above.

[0033] FIG. **6** is a front view of the display device **170** used in the stroller **100** of FIG. **5**. The display device **170** may include a screen **190**, memory **195**, communication interface **200**, a camera **205**, speakers **210**, and a processor **215**.

[0034] The screen **190** may be an LCD, OLED, or other type of screen **190** that can output signals. The screen **190** may be configured to display text, images, video, etc., to the person sitting in the seat **115** of the stroller **100**. The content displayed by the screen **190** may be stored in the memory **195** or streamed from, e.g., a mobile device connected to the display device **170** through the communication interface **200**, the communication port **145**, or a combination thereof. In some instances, the screen **190** may be configured to display content streamed from a remote server via the communication interface **200**.

[0035] The memory **195** is implemented via circuits, chips or other electronic components and can include one or more of read only memory (ROM), random access memory (RAM), flash memory, electrically programmable memory (EPROM), electrically programmable and erasable memory (EEPROM), embedded MultiMediaCard (eMMC), a hard drive, or any volatile or non-volatile media etc. The memory **195** may store instructions executable by the processor **215** and data such as the content displayed to the child in the stroller **100**. The instructions and data stored in the memory **195** may be accessible to the processor **215** and possibly other components of the stroller **100**.

[0036] The communication interface **200** is implemented via an antenna, circuits, chips, or other electronic components that facilitate wireless communication between the display device **170**, the communication port **145**, wireless access points, cellular towers, or the like. Components of the communication interface **200** may be programmed to communicate in accordance with any number of wired or wireless communication protocols. For instance, the components of the communication interface **200** may be programmed to communicate in accordance with a satellite-communication protocol, a cellular-based communication protocol (5G, LTE, 3G, etc.), Bluetooth®, Bluetooth® Low Energy, Ethernet, the Controller Area Network (CAN) protocol, WiFi, the Local Interconnect Network (LIN) protocol, etc.

[0037] The camera **205** is a vision sensor. The camera **205** may capture images of the child sitting in the seat **115** of the stroller **100**. To capture such images, the camera **205** may include a lens that projects light toward, e.g., a CCD image sensor, a CMOS image sensor, etc. The camera **205** processes the light and generates the image. The image may be output to the processor **215** and, as discussed in greater detail below, can be used to record or monitor the child in the seat **115** and/or display the image of the child in the seat **115** on the display device **170**.

[0038] The speakers **210** may be implemented by one or more electroacoustic transducers that convert electrical signals into audible sound. Signals received by the speakers **210** cause the transducers to vibrate. As such, the speakers **210** may play sounds associated with the content being displayed on the display device **170**. In some instances, the speakers **210** may be operated independently of the display device **170**. That is, the speakers **210** may play audio from a user's mobile device in wired or wireless communication with the display device **170**.

[0039] The processor **215** is implemented via circuits, chips, or other electronic component and may include one or more microcontrollers, one or more field programmable gate arrays (FPGAs), one or more application specific integrated circuits (ASICs), one or more digital signal processors (DSPs), one or more customer specific integrated circuits, etc. The processor **215** can execute instructions that control the operation of the screen **190**, the memory **195**, the communication interface **200**, the camera **205**, the speakers **210**, and any other component of the display device **170**.

[0040] FIG. **7** illustrates an example stroller **100** having removable skis **220**. The skis **220** may replace the base **150** and wheels **110** in certain circumstances, such as when there is snow on the ground. In such cases, the base **150** may be removed and replaced with the skis **220**. When the skis **220** are installed, the stroller **100** may be easily pushed on snowy surfaces. The skis **220** may be installed by lifting the frame **105** off the base **150** and installing the frame **105** onto the skis **220**. The opposite sequence may be used to reinstall the base **150** with the wheels **110**. That is, the skis **220** may be removed from the frame **105**, and the base **150** with the wheels **110** may be reinstalled

onto the frame **105**.

[0041] FIGS. **8**A-**8**B illustrates example screenshots of an app **225** that may be used to entertain the child in the stroller **100**. The app **225** may provide educational and/or entertaining content to the child. The content of the app **225** may be presented to the child via the display device **170**. The app **225** may present educational and/or entertaining content related to counting or mathematical skills, colors, animals, language, or sounds.

[0042] The app **225** may have a graphical user interface that includes touch-screen controls **230**. The controls may include a navigation bar **235** with virtual buttons that allow the user to navigate the different educational and/or entertaining content options. The controls **230** may further include contextual buttons **240** that change depending on the educational and/or entertaining content being shown. In FIGS. **8**A and **8**B, the contextual buttons **240** may include, e.g., "show all" to show all images, "play" to play an animal sound, "reset" to restart a language lesson, or "start" to start a language lesson.

[0043] In the example shown in FIG. **8**A, the app **225** displays a picture of an animal (e.g., a dog) on the display screen **190**. A sound associated with the animal (e.g., a dog barking) may be played through the speakers **210**. By using the app **225** while riding in the stroller **100**, the child may begin to associate animals with the sounds the animal makes. In the example of FIG. **8**B, the child is exposed to another language (e.g., French). In this example, the child is shown words in French along with their English translation.

[0044] In general, the computing systems and/or devices described may employ any of a number of computer operating systems, including, but by no means limited to, versions and/or varieties of the Microsoft Windows® operating system, the Unix operating system (e.g., the Solaris® operating system distributed by Oracle Corporation of Redwood Shores, California), the AIX UNIX operating system distributed by International Business Machines of Armonk, New York, the Linux operating system, the OS X, macOS, and iOS operating systems distributed by Apple Inc. of Cupertino, California, the BlackBerry OS operating system distributed by Blackberry, Ltd. of Waterloo, Canada, and the Android operating system developed by Google, Inc. and the Open Handset Alliance, or the like. Examples of computing devices include, without limitation, a computer workstation, a server, a desktop, notebook, laptop, or handheld computer, or some other computing system and/or device.

[0045] Computing devices generally include computer-executable instructions, where the instructions may be executable by one or more computing devices such as those listed above. Computer-executable instructions may be compiled or interpreted from computer programs created using a variety of programming languages and/or technologies, including, without limitation, and either alone or in combination, Java™, C, C++, Visual Basic, Java Script, Perl, etc. Some of these applications may be compiled and executed on a virtual machine, such as the Java Virtual Machine, the Dalvik virtual machine, or the like. In general, a processor (e.g., a microprocessor) receives instructions, e.g., from a memory, a computer-readable medium, etc., and executes these instructions, thereby performing one or more processes, including one or more of the processes described herein. Such instructions and other data may be stored and transmitted using a variety of computer-readable media.

[0046] A computer-readable medium (also referred to as a processor-readable medium) includes any non-transitory (e.g., tangible) medium that participates in providing data (e.g., instructions) that may be read by a computer (e.g., by a processor of a computer). Such a medium may take many forms, including, but not limited to, non-volatile media and volatile media. Non-volatile media may include, for example, optical or magnetic disks and other persistent memory. Volatile media may include, for example, dynamic random access memory (DRAM), which typically constitutes a main memory. Such instructions may be transmitted by one or more transmission media, including coaxial cables, copper wire and fiber optics, including the wires that comprise a system bus coupled to a processor of a computer. Common forms of computer-readable media include, for

example, a floppy disk, a flexible disk, hard disk, magnetic tape, any other magnetic medium, a CD-ROM, DVD, any other optical medium, punch cards, paper tape, any other physical medium with patterns of holes, a RAM, a PROM, an EPROM, a FLASH-EEPROM, any other memory chip or cartridge, or any other medium from which a computer can read.

[0047] Databases, data repositories or other data stores described herein may include various kinds of mechanisms for storing, accessing, and retrieving various kinds of data, including a hierarchical database, a set of files in a file system, an application database in a proprietary format, a relational database management system (RDBMS), etc. Each such data store is generally included within a computing device employing a computer operating system such as one of those mentioned above, and are accessed via a network in any one or more of a variety of manners. A file system may be accessible from a computer operating system, and may include files stored in various formats. An RDBMS generally employs the Structured Query Language (SQL) in addition to a language for creating, storing, editing, and executing stored procedures, such as the PL/SQL language mentioned above.

[0048] In some examples, system elements may be implemented as computer-readable instructions (e.g., software) on one or more computing devices (e.g., servers, personal computers, etc.), stored on computer readable media associated therewith (e.g., disks, memories, etc.). A computer program product may comprise such instructions stored on computer readable media for carrying out the functions described herein.

[0049] With regard to the processes, systems, methods, heuristics, etc. described herein, it should be understood that, although the steps of such processes, etc. have been described as occurring according to a certain ordered sequence, such processes could be practiced with the described steps performed in an order other than the order described herein. It further should be understood that certain steps could be performed simultaneously, that other steps could be added, or that certain steps described herein could be omitted. In other words, the descriptions of processes herein are provided for the purpose of illustrating certain embodiments, and should in no way be construed so as to limit the claims.

[0050] Accordingly, it is to be understood that the above description is intended to be illustrative and not restrictive. Many embodiments and applications other than the examples provided would be apparent upon reading the above description. The scope should be determined, not with reference to the above description, but should instead be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled. It is anticipated and intended that future developments will occur in the technologies discussed herein, and that the disclosed systems and methods will be incorporated into such future embodiments. In sum, it should be understood that the application is capable of modification and variation.

[0051] All terms used in the claims are intended to be given their ordinary meanings as understood by those knowledgeable in the technologies described herein unless an explicit indication to the contrary is made herein. In particular, use of the singular articles such as "a," "the," "said," etc. should be read to recite one or more of the indicated elements unless a claim recites an explicit limitation to the contrary.

[0052] The Abstract is provided to allow the reader to quickly ascertain the nature of the technical disclosure. It is submitted with the understanding that it will not be used to interpret or limit the scope or meaning of the claims. In addition, in the foregoing Detailed Description, it can be seen that various features are grouped together in various embodiments for the purpose of streamlining the disclosure. This method of disclosure is not to be interpreted as reflecting an intention that the claimed embodiments require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive subject matter lies in less than all features of a single disclosed embodiment. Thus the following claims are hereby incorporated into the Detailed Description, with each claim standing on its own as a separately claimed subject matter.

Claims

1. A stroller comprising: a frame having a shaft; a seat depending from the frame; a base removably attached to the frame by the shaft of the frame; and wheels disposed on the base, wherein the shaft of the frame is inserted into the base to allow the frame to rotate relative to the base.

2. The stroller of claim 1, further comprising a canopy that may be manually unfolded to extend from the seat.

3. The stroller of claim 2, further comprising a fan disposed on the canopy.

4. The stroller of claim 3, further comprising a solar panel disposed on the canopy and electrically connected to the fan.

5. The stroller of claim 2, further comprising a display device disposed on the canopy.

6. The stroller of claim 5, wherein the display device includes a screen and speakers.

7. The stroller of claim 5, wherein the display device includes a communication interface configured to facilitate wireless communication with a mobile device.

8. The stroller of claim 5, wherein the display device includes a camera.

9. The stroller of claim 1, further comprising a base with skis attachable to the frame when the base is removed.

10. A stroller comprising: a frame; a seat depending from the frame; a base disposed on the frame; a canopy that may be manually unfolded to extend from the seat; and a display device incorporated into the canopy and viewable from the seat.

11. The stroller of claim 10, further comprising a solar panel disposed on the canopy and electrically connected to the display device.

12. The stroller of claim 10, wherein the display device includes a screen and speakers.

13. The stroller of claim 10, wherein the display device includes a communication interface configured to facilitate wireless communication with a mobile device.

14. The stroller of claim 13, wherein the display device is configured to display content based on signals received from the mobile device.

15. The stroller of claim 10, wherein the display device includes a camera.

16. The stroller of claim 15, wherein the display device is configured to display content based on signals received from the camera.

17. The stroller of claim 10, further comprising a cooling fan disposed on the canopy.

18. The stroller of claim 17, further comprising a solar panel disposed on the canopy and electrically connected to the cooling fan.

19. The stroller of claim 16, wherein the display device is configured to display entertainment and educational content based on signals received from an app on a mobile device.