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### (54) Overhead organizer

(57) An overhead organizer (110) is disclosed that is used to store items. The overhead organizer according to the invention takes advantage of little-used space near a ceiling to store items. The overhead organizer includes a ceiling mounted unit (120) that is configured to be coupled to a ceiling, a storage unit (130) that holds items to be stored, and one or more than one retractable extender (140) which retractably couples the storage unit to the ceiling mounted unit. The one or more than one retractable extender is retracted and extended with a retractor mechanism. The retractor mechanism can be a double spool constant torque spring. The retractor mechanism extends or retracts the one or more than one retractable extender to adjust the distance between the storage unit and the ceiling. In some embodiments the retractor mechanism is controlled using a wireless remote control unit.

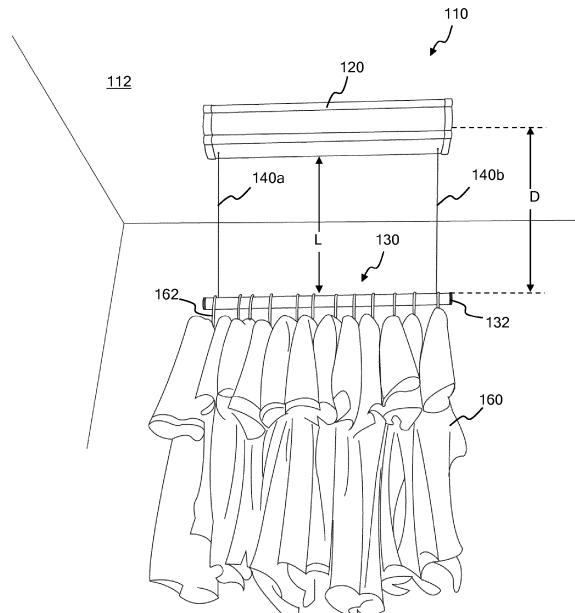


FIG. 2

## Description

### CROSS REFERENCE TO RELATED APPLICATION

**[0001]** This application claims priority to U.S. Provisional Application Serial No. 61/621,803, filed April 9, 2012 by James Shaffer, and entitled "Overhead Organizer", which is incorporated herein by reference in its entirety.

### BACKGROUND OF THE INVENTION

#### Technical Field

**[0002]** This invention relates generally to storage devices and in particular to a device that allows the space close to a ceiling to be used for storage.

#### State of the Art

**[0003]** Storage devices for homes and businesses are in great demand for use in organizing and storing items which may or may not be in current use. Cupboards, shelves, racks, and stackable containers are in common use for storing items. Shelves and racks can be made to reach towards the ceiling, but it may become difficult for an individual to reach the items placed in the upper shelves or containers when they are not tall enough to reach that high. It is desirable to have a storage unit which can use space near the ceiling to store items, but which can be lowered towards the floor to add or retrieve items from the storage unit. Devices exist which allow clothes hangers to be manually moved towards and away from the ceiling, but these devices may be difficult or awkward to use for those with minimal strength or manual dexterity. It is therefore desirable to have an automated storage device which can be moved towards and away from a ceiling. In addition, it is desirable to have a storage unit that can be used to store many different types of items near a ceiling. And in addition, it is desirable to have a storage unit that can be used to store heavy items as well as items that are not stored on clothes hangers. Therefore, an overhead organizer has been developed that can be used to store many different types of items, that uses space near a ceiling to store the items, and that can be easily accessed from below.

### DISCLOSURE OF THE INVENTION

**[0004]** The disclosed invention relates to storage devices and in particular to a device that allows space close to a ceiling to be used for storage. Disclosed is an overhead organizer that includes a ceiling mounted unit, a storage unit, and one or more than one retractable extender. The ceiling mounted unit is fixedly attached to a ceiling. The storage unit can be used to hold items to be stored. The one or more than one retractable extender retractably couples the storage unit to the ceiling mount-

ed unit. The storage unit moves closer to the ceiling and the ceiling mounted unit in response to the retractable extender being retracted. The storage unit moves closer to the floor in response to the retractable extender being extended. The one or more than one retractable extender is mounted to a retractor mechanism in the ceiling mounted unit. The retractor mechanism retracts and extends the one or more than one retractable extender. In some embodiments a retractor motor controls the retractor mechanism. In some embodiments a remote control unit wirelessly controls the retractor motor such that the one or more than one retractable extender can be extended and retracted using the remote control.

**[0005]** The storage unit can take many forms. In some embodiments the storage unit is a rod for hanging clothes hangers on. In some embodiments the storage unit is a shelf on which items to be stored can be set. In some embodiments the storage unit is a box for storing items in. In some embodiments the storage unit is a rod with S-hooks for hanging items from. In some embodiments the storage unit is rings with S-hooks that items can be hung from. In some embodiments the storage unit is a device for hanging bags from. In some embodiments the storage unit is a storage box. The storage unit can be any device or unit that can store, hang, hold, or contain an item to be stored.

**[0006]** Disclosed is an overhead organizer according to the invention that includes a ceiling mounted unit. The ceiling mounted unit includes a top plate, where the top plate is configured to be coupled to a ceiling. The overhead organizer according to the invention also includes a retractor mechanism coupled to the top plate; a storage unit, where the storage unit holds an item to be stored; a first retractable extender; and a second retractable extender. The first and the second retractable extenders retractably couple the storage unit to the ceiling mounted unit. The retractor mechanism extends and retracts the first and the second retractable extenders.

**[0007]** In some embodiments the retractor mechanism includes a spring mount coupled to the top plate; a drive spool rotatably coupled to the spring mount; a drive shaft fixedly coupled to drive spool; a first cable spool fixedly coupled to the drive shaft; and a second cable spool fixedly coupled to the drive shaft. The drive shaft rotates in response to rotation of the drive spool. The first cable spool rotates in response to rotation of the drive shaft, and the first retractable extender unwinds from and winds onto the first cable spool to extend and retract, respectively the first retractable extender. The second cable spool rotates in response to rotation of the drive shaft, and the second retractable extender unwinds from and winds onto the second cable spool to extend and retract, respectively the second retractable extender.

**[0008]** In some embodiments of the overhead organizer according to the invention, the first cable spool is fixedly coupled to a first end of the drive shaft; the second cable spool is fixedly coupled to a second end of the drive shaft; and the drive shaft extends through the drive spool

such that the drive spool is positioned along the drive shaft in a location between the first cable spool and the second cable spool. In some embodiments the retractor mechanism also includes a first spring spool rotatably coupled to the spring mount; a second spring spool rotatably coupled to the spring mount; and a spring coupled to each of: the first spring spool; the second spring spool; and the drive spool; where the spring provides a constant amount of torque on the drive spool as the drive spool rotates.

**[0009]** In some embodiments the first spring spool is coupled to the spring mount in a position between the drive spool and the top plate. In some embodiments the second spring spool is coupled to the spring mount in a position between the drive spool and the top plate. In some embodiments the first spring spool has a first spring spool diameter; the second spring spool has a second spring spool diameter; the drive spool has a drive spool diameter; the drive spool diameter is larger than the first spring spool diameter; and the drive spool diameter is larger than the second spring spool diameter. In some embodiments the first spring spool diameter is approximately equal to the second spring spool diameter.

**[0010]** Disclosed is an overhead organizer that includes a ceiling mounted unit comprising a top plate, where the top plate is configured to be coupled to a ceiling; a storage unit, where the storage unit holds an item to be stored; a retractor mechanism coupled to the top plate; and one or more than one retractable extender, wherein the one or more than one retractable extender retractably couples the storage unit to the retractor mechanism. In some embodiments of the overhead organizer according to the invention, the storage unit encloses the ceiling mounted unit in response to each of the one or more than one retractable extenders being fully retracted. In some embodiments the storage unit includes a shelf. In some embodiments the storage unit includes a clothes cubby.

**[0011]** In some embodiments the overhead organizer according to the invention includes a wireless remote control unit, where the retractor mechanism extends and retracts the storage unit in response to receiving a wireless communication from the wireless remote control unit. In some embodiments the retractor mechanism includes a double spool constant torque spring.

**[0012]** Disclosed is a method of forming an overhead organizer according to the invention. The method of forming an overhead organizer according to the invention includes the step of forming a ceiling mounted unit, where the ceiling mounted unit is configured to be coupled to a ceiling. The method of forming an overhead organizer according to the invention also includes the steps of coupling a retractor mechanism to a top plate of the ceiling mounted unit; coupling one or more than one retractable extender to the retractor mechanism; and coupling a storage unit to the one or more than one retractable extender. The storage unit moves closer or farther away from the ceiling mounted unit in response to the retractor mech-

anism retracting or extending, respectively, the one or more than one retractable extender.

**[0013]** In some embodiments of the method of forming an overhead organizer according to the invention, the 5 step of coupling a retractor mechanism to a top plate of the ceiling mounted unit includes the steps of coupling a spring mount to the top plate; coupling a double spool constant torque spring to the spring mount; and coupling a drive shaft to a drive spool of the double spool constant torque spring, where the drive shaft rotates with respect to the spring mount, and where each of the one or more than one retractable extender is either extended or retracted in response to rotation of the drive shaft. In some embodiments the step of coupling a double spool constant torque spring to the spring mount includes the steps of coupling a drive spool to the spring mount; coupling a first spring spool to the spring mount; coupling a second spool to the spring mount; and coupling a spring to the drive spool, the first spring spool, and the second spring 10 spool, where the spring controls the rotational torque applied to the drive spool. In some embodiments the step of coupling a first spring spool to the spring mount includes the step of coupling a first spring spool to the spring mount such that the first spring mount is located 15 between the drive shaft and the top plate. In some embodiments the storage unit touches the ceiling in response to each of the one or more than one retractable extender being fully retracted. In some embodiments the storage unit encloses the ceiling mounted unit in response to each of the one or more than one retractable extender being fully retracted

**[0014]** Disclosed is a method of forming an overhead organizer that includes the step of attaching a ceiling mounted unit to a ceiling, where the ceiling mounted unit 20 comprises a retractor mechanism and a retractor motor, where the retractor mechanism is operated by the retractor motor. The method of forming an overhead organizer according to the invention also includes the step of coupling a retractable extender to the retractor mechanism, 25 where the length of the retractable extender is adjusted by the retractor mechanism. The method of forming an overhead organizer according to the invention also includes the step of coupling a storage unit to the retractable extender, where the distance between the storage 30 unit and the ceiling is adjusted in response to adjusting the length of the retractable extender. And the method of forming an overhead organizer according to the invention also includes the step of wirelessly electronically coupling a remote control unit to the retractor motor, where 35 the retractor motor instructs the retractor mechanism to adjust the length of the retractable extender in response to receiving a command from the remote control unit. 40 **[0015]** In some embodiments the method of coupling a storage unit to the retractable extender includes coupling a rod and s-hooks to the retractable extender. In some embodiments the method of coupling a storage unit to the retractable extender includes coupling a shelf unit to the retractable extender. In some embodiments 45 50 55

the method of coupling a storage unit to the retractable extender includes coupling a storage net to the retractable extender. In some embodiments the method of coupling a storage unit to the retractable extender includes coupling a storage box to the retractable extender, where the storage box touches the ceiling in response to the retractable extender being in a fully retracted state. In some embodiments the method of coupling a storage unit to the retractable extender includes coupling a storage box to the retractable extender, where the storage box encloses the ceiling mounted unit in response to the retractable extender being in a fully retracted state.

**[0016]** The foregoing and other features and advantages of the present invention will be apparent from the following more detailed description of the particular embodiments of the invention, as illustrated in the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0017]** FIG. 1 shows an embodiment of overhead organizer 110 according to the invention.

**[0018]** FIG. 2 shows overhead organizer 110 of FIG. 1 with first and second retractable extenders 140a and 140b in an extended position.

**[0019]** FIG. 3 shows a top perspective view of one embodiment of ceiling mounted unit 120 according to the invention, showing one embodiment of retractor mechanism 122 of overhead organizer 110, which in this embodiment is spring-loaded rod 199.

**[0020]** FIG. 4 shows a top perspective view of a further embodiment of ceiling mounted unit 120, showing another embodiment of retractor mechanism 122 of overhead organizer 110 according to the invention. In this embodiment retractor mechanism 122 is rod 199 that is operated by retractor motor 126. Retractor motor 126 is controlled by remote control unit 150.

**[0021]** FIG. 5 shows another embodiment of overhead organizer 110 according to the invention, and another embodiment of ceiling mounted unit 120 according to the invention.

**[0022]** FIG. 6 shows a left side perspective view of overhead organizer 110 of FIG. 5, with enclosure 124 removed so that retractor mechanism 122 is revealed.

**[0023]** FIG. 7 shows a right side perspective view of overhead organizer 110 of FIG. 5, with enclosure 124 removed so that retractor mechanism 122 is revealed.

**[0024]** FIG. 8 shows a sectional end view of overhead organizer 110 of FIG. 7, with cable spool 184 removed so that double spool constant torque spring 176 can be seen.

**[0025]** FIG. 9 shows example embodiments of storage units 130 according to the invention that can be coupled to retractable extenders 140a and 140b of ceiling mounted unit 120 of overhead storage unit 110 according to the invention.

**[0026]** FIG. 10 shows an additional embodiment of overhead organizer 110 according to the invention. In

this embodiment storage unit 130 include clothes cubby 166 and clothes hanger bar 132.

**[0027]** FIG. 11 shows a further embodiment of overhead organizer 110 according to the invention. In this embodiment storage unit 130 is box 170. Box 170 is used to store sports equipment 164 in this embodiment. In this figure retractable extenders 140a and 140b are in an extended position.

**[0028]** FIG. 12 shows overhead organizer 110 of FIG. 11 with retractable extenders 140a and 140b in a state between fully extended and fully retracted.

**[0029]** FIG. 13 shows overhead organizer 110 of FIG. 11 with retractable extenders 140a and 140b in a fully retracted state. In this state storage box 170 touches ceiling 112. Also in this state storage box 170 encloses ceiling mounted unit 120. In this state ceiling 112 is the top to storage box 170.

**[0030]** FIG. 14 illustrates method 310 of forming an overhead organizer according to the invention.

**[0031]** FIG. 15 illustrates method 310 of forming an overhead organizer according to the invention.

#### DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

**[0032]** As discussed above, embodiments of the present invention relate to storage devices and in particular to a device that allows space close to a ceiling to be used for storage. FIG. 1 through FIG. 3 show an embodiment of overhead organizer 110 according to the invention.

Overhead organizer 110 according to the invention includes ceiling mounted unit 120. Ceiling mounted unit 120 according to the invention is configured to be coupled to a ceiling. Ceiling mounted unit 120 is mounted to ceiling 112 in the figures. Overhead organizer 110 according to the invention also includes storage unit 130, which is used to hold items to be stored. In the embodiment of overhead organizer 110 shown in FIG. 1 through FIG. 3, storage unit 130 is clothes hanger bar 132. In this embodiment the items to be stored are clothes 160 that are on clothes hangers 162. Clothes hangers 162 holding clothes 160 are hung on clothes hanger bar 132. Storage unit 130 according to the invention can take many forms, as will be discussed in more detail shortly.

**[0033]** Overhead organizer 110 according to the invention also includes one or more than one retractable extender 140, which retractably couples storage unit 130 to ceiling mounted unit 120. In this document the term 'retractably couples' means storage unit 130 is coupled to ceiling mounted unit 120 such that the distance between storage unit 130 and ceiling mounted unit 120 can be adjusted by either retracting or extending the one or more than one retractable extender 140. Retractable extenders 140 are the devices used to adjust the distance between storage unit 130 and ceiling mounted unit 120.

**[0034]** In this embodiment the one or more than one retractable extenders 140 includes first retractable extender 140a and second retractable extender 140b. In

some embodiments overhead organizer 110 includes one retractable extender 140. In some embodiments overhead organizer 140 includes more than two retractable extenders 140. Retractable extenders 140 are retracted into or extended from ceiling mounted unit 120. Retracting or extending retractable extenders 140 adjusts the length L of retractable extenders 140, as shown in FIG. 2. Retracting or extending retractable extenders 140 adjusts the distance D between storage unit 130 and ceiling 112. FIG. 1 shows an example of overhead organizer 110 with retractable extenders 140 in a fully retracted state. In this state length L of retractable extenders 140 is at a minimum length L (length L shown in FIG. 2), and storage unit 130 is adjacent ceiling mounted unit 120. In this position clothes 160 are stored close to ceiling 112. Clothes 160 in this position are being stored close to ceiling 112 and are therefore leaving space closer to the floor for other items to be stored. However, retractable extenders 140 can be extended for easy access to storage unit 130 and clothes 160.

**[0035]** FIG. 2 shows a perspective view of overhead organizers 110 of FIG. 1, with retractable extenders 140a and 140b in an extended position. In this position storage unit 130 in the form of clothes hanger bar 132 is a distance D from ceiling 112, and retractable extenders 140a and 140b each have a length L. Extending retractable extenders 140 moves storage unit 130 away from ceiling mounted unit 120, away from ceiling 112, and towards the floor. In this position storage unit 130 can be easily accessed by an individual standing on the floor.

**[0036]** Thus overhead organizer 110 can be used to store items close to a ceiling so that space near the ceiling that is not often utilized can be fully used as storage space. When retractable extenders 140 are retracted, storage unit 130 is positioned close to ceiling 112 and can be used to hold items to be stored until they are needed. When retractable extenders 140 are extended, storage unit 130 is moved away from ceiling 112 and closer to the floor so that storage unit 130 can be easily accessed. Thus retractable extenders 140 move storage unit 130 towards and away from ceiling mounted unit 120, moving storage unit 130 between a stored position near ceiling 112 and an accessible position nearer the floor.

**[0037]** Ceiling mounted unit 120 according to the invention can take many forms, some of which are shown in the figures. One embodiment of ceiling mounted unit 120 according to the invention is shown in FIG. 3. Ceiling mounted unit 120 in this embodiment includes enclosure 124 and retractor mechanism 122. Retractor mechanism 122 is coupled to the one or more than one retractable extenders 140, and is configured to retract and extend retractable extenders 140. Enclosure 124 encloses and contains the pieces of ceiling mounted unit 120, and adds decorative appeal to ceiling mounted unit 120. Enclosure 124 can take any form or shape that encloses the parts and pieces of ceiling mounted unit 120.

**[0038]** Retractor mechanism 122 in the embodiment

of ceiling mounted unit 120 shown in FIG. 3 is spring-loaded rod 199. In this embodiment retractable extenders 140a and 140b are wound around spring-loaded rod 199. Spring-loaded rod 199 is rotated in one direction to wind retractable extenders 140a and 140b around rod 199, which retracts retractable extenders 140a and 140b. Spring-loaded rod 199 is rotated in the opposite direction to unwind retractable extenders 140a and 140b from rod 199, extending retractable extenders 140a and 140b. In this embodiment rod 199 is rotated by a spring mechanism that can be locked or unlocked manually or locked or unlocked using manual pull rope 144 and handle 146. In some embodiments rod 199 is rotated by use of other manual means such as a lever or crank mechanism.

**[0039]** FIG. 4 shows a further embodiment of overhead

organizer 110, with a further embodiment of ceiling mounted unit 120. In the embodiment of ceiling mounted unit 120 of FIG. 4, retractor mechanism 122 includes retractor motor 126 and rotating rod 199. Retractor motor 126 controls the rotation of rod 199. In this embodiment retractor motor 126 controls the retraction and extension of retractable extenders 140a and 140b by rotating rod 199. Rotating rod 199 causes retractable extenders 140a and 140b to retract or extend, which in turn adjusts length L of retractable extenders 140, and distance D between ceiling 112 and ceiling mounted unit 120 (see FIG. 2). Adjusting the length L of retractable extenders 140 moves storage unit 130 towards and away from ceiling 112. Retractor motor 126 can be controlled by many different means, including but not limited to switches or wired controllers.

**[0040]** In the embodiment shown in FIG. 4, retractor motor 126 is wirelessly electronically coupled to remote control unit 150, as shown in FIG. 4. Remote control unit 150 is used by an individual to control retractor mechanism 122, which includes rotating rod 199 and retractor motor 126 in this embodiment. Remote control unit 150 transmits wireless communication 158 to retractor motor 126. Wireless communication 158 is shown in FIG. 4 as two-way wireless communication 158, however, in some

embodiments wireless communication 158 is one-way wireless communication 158. Wireless communication 158 contains commands to retract or extend retractable extenders 140a and 140b. In this example embodiment, pressing button 152 will cause retractor motor 126 to rotate in a direction which will wind retractable extenders 140a and 140b onto rod 199, retracting retractable extenders 140a and 140b, which decreases length L and distance D. In this example embodiment, pressing button 154 will cause retractor motor 126 to rotate in a direction which will unwind retractable extenders 140a and 140b from rod 199, extending retractable extenders 140, which increases length L and distance D. Pressing button 156 on remote control unit 150 will cause retractor motor 126

to stop the rotation of rod 199. One embodiment of remote control unit 150 is shown, but it is to be understood that remote control unit 150 can take any form and use any type of buttons, switches, or input to send user input as wireless communication 158 to retractor motor 126 and/or retractor mechanism 122.

**[0041]** Retractor motor 126 can take many different forms. Retractor motor 126 can be any device that can be used to automate retractor mechanism 122. Retractor motor 126 can be operated with wired controls or wireless controls. In some embodiments retractor motor 126 is not used and retractor mechanism 122 is operated manually.

**[0042]** Retractable extenders 140 can take many different forms. In the embodiment shown retractable extenders 140 are two pieces of plastic string 140a and 140b. It is to be understood that retractable extenders 140 can be any piece of material that can be retracted or extended to move storage unit 130 towards or away from ceiling mounted unit 120. In the embodiment shown in the figures, overhead organizer 110 uses two retractable extenders 140a and 140b, but this is not meant to be limiting to the invention. In some embodiments overhead organizer 110 uses one retractable extender 140. In some embodiments overhead organizer 110 uses more than two retractable extenders 140. Overhead organizer 110 according to the invention can use any number of retractable extenders 140.

**[0043]** Retractable extenders 140 according to the invention can be a piece or pieces of wire, twine, ribbon, material, chain, plastic, metal or other filament or string. Retractable extender 140 can be any number or form of pieces of material that can be retracted or extended to move storage unit 130 towards or away from ceiling mounted unit 120.

**[0044]** Retractor mechanism 122 can take many different forms. Retractor mechanism 122 can be any mechanism or device which adjusts the length L of retractable extenders 140. Retractor mechanism 122 can be a bar, a spring-loaded bar, rotating cogs, rotating wheels, or any other device for retracting or extending retractable extenders 140. In some embodiments of ceiling mounted unit 120 there is more than one retractor mechanism 122. In some embodiments of ceiling mounted unit 120, retractor mechanism 122 is mounted outside of enclosure 124 of ceiling mounted unit 120. FIG. 5 through FIG. 8 gives a further embodiment of ceiling mounted unit 120 and retractor mechanism 122.

**[0045]** FIG. 5 shows an additional embodiment of overhead organizer 110 according to the invention. Overhead organizer 110 in this embodiment includes ceiling mounted unit 120, storage unit 130, and one or more than one retractable extender 140. In this embodiment the one or more than one retractable extender 140 takes the form of first retractable extender 140a, and second retractable extender 140b. Storage unit 130 holds an item to be stored, such as clothes 160 as shown in FIG. 1. The items to be stored and storage unit 130 can take many different

forms, as will be discussed shortly.

**[0046]** Ceiling mounted unit 120 is configured to be coupled to ceiling 112 as shown in FIG. 1. In the embodiment shown in FIG. 5 through FIG. 8, ceiling mounted unit includes top plate 118 and mounting plate 116. Top plate 118 is configured to be coupled to ceiling 112 using mounting plate 116. Mounting plate 116 is coupled to ceiling 112 using screws, nails, or other types of couplers or hanger elements. Top plate 118 is coupled to mounting plate 116, which couples top plate 118 and ceiling mounted unit 120 to ceiling 112.

**[0047]** The one or more than one retractable extender 140 retractably couples storage unit 130 to ceiling mounted unit 120. In the embodiment shown in the figures, first and second retractable extenders 140a and 140b retractably couple storage unit 130 to ceiling mounted unit 120.

**[0048]** FIG. 6 through FIG. 8 show views of the internal components of ceiling mounted unit 120 of FIG. 5. FIG. 6 shows a left side perspective view of overhead organizer 110 of FIG. 5, with enclosure 124 removed so that retractor mechanism 122 can be seen. FIG. 7 shows a right side perspective view of overhead organizer 110 of FIG. 5, with enclosure 124 removed so that retractor mechanism 122 can be seen. FIG. 8 shows an end view of overhead organizer 110 of FIG. 5, with cable spool 184 removed so that double spool constant torque spring 176 (to be discussed shortly) can be seen.

**[0049]** Retractor mechanism 122 in the embodiment shown in FIG. 5 through FIG. 8 is coupled to top plate 118 of ceiling mounted unit 120. Retractor mechanism 122 includes double spool constant torque spring 176 and spring mount 178. Double spool constant torque spring 176 is coupled to spring mount 178. Spring mount 178 is coupled to top plate 118. Spring mount 178 is a plate that is fixedly coupled to top plate 118, and which holds retractor mechanism 122 in place in ceiling mounted unit 120.

**[0050]** Double spool constant torque spring 176 of retractor mechanism 122 includes drive spool 180, as shown in FIG. 6 through FIG. 8. Drive spool 180 is rotatably coupled to spring mount 178. Drive spool 180 can be rotatably coupled to spring mount 178 in many different ways. In this embodiment drive spool 180 is rotatably coupled to spring mount 178 using a bearing. Drive shaft 182 is fixedly coupled to drive spool 180. Drive shaft 182 is fixedly coupled to drive spool 180 such that drive spool 180 and drive shaft 182 rotate together. Drive shaft 182 rotates in response to drive spool 180 rotating, and vice versa.

**[0051]** Drive shaft 182 has first end 188 and second end 190 (see FIG. 7), with the length of drive shaft 182 extending between first end 188 and second end 190. At each of the ends 188 and 190 of drive shaft 182 is a cable spool fixedly attached to drive shaft 182. First cable spool 184 is fixedly attached to drive shaft 182 first end 188, such that first cable spool 184 rotates with drive shaft 182. Second cable spool 186 is fixedly attached to drive shaft 182 second end 190, such that second cable spool

186 rotates with drive shaft 182.

**[0052]** Thus retractor mechanism 122 includes drive shaft 182, which extends through drive spool 180. Drive spool 180 is rotatably coupled to spring mount 178, thus drive shaft 182 is rotatably coupled to spring mount 178 through drive spool 180. Drive shaft 182 extends through drive spool 180 and spring mount 178. Drive spool 180 is fixedly coupled along the length of drive shaft 182 between first cable spool 184 and second cable spool 186. Drive shaft 182, first cable spool 184, second cable spool 186, and drive spool 180 are coupled to each other such that they rotate together.

**[0053]** First retractable extender 140a unwinds from and winds onto first cable spool 184 to extend and retract, respectively, first retractable extender 140a. First retractable extender 140a unwinds from and winds onto first cable spool 184 in response to rotation of first cable spool 184. First cable spool 184 is fixedly coupled to drive shaft 182, so first cable spool 184 rotates in response to rotation of drive shaft 182. First retractable extender 140a unwinds from first cable spool 184 to extend first retractable extender 140a. First retractable extender 140a unwinds from first cable spool 184 in response to rotation of first cable spool 184 in a first direction of rotation. First retractable extender 140a winds onto first cable spool 184 to retract first retractable extender 140a. First retractable extender 140a winds onto first cable spool 184 in response to rotation of first cable spool 184 in a second direction of rotation opposite the first direction.

**[0054]** Second retractable extender 140b unwinds from and winds onto second cable spool 186 to extend and retract, respectively, second retractable extender 140b. Second retractable extender 140b unwinds from and winds onto second cable spool 186 in response to rotation of second cable spool 186. Second cable spool 186 is fixedly coupled to drive shaft 182, so second cable spool 186 rotates in response to rotation of drive shaft 182. Second retractable extender 140b unwinds from second cable spool 186 to extend second retractable extender 140b. Second retractable extender 140b unwinds from second cable spool 186 in response to rotation of second cable spool 186 in the first direction of rotation. Second retractable extender 140b winds onto second cable spool 186 to retract second retractable extender 140b. Second retractable extender 140b winds onto second cable spool 186 in response to rotation of second cable spool 186 in a second direction of rotation opposite the first direction.

**[0055]** Thus retractable extenders 140a and 140b are extended and retracted as drive shaft 182, drive spool 180, and first and second cable spools 184 and 186 rotate. In this embodiment the rotation of drive shaft 182, drive spool 180, and first and second cable spools 184 and 186, is controlled by spring 196 (see FIG. 7 and FIG. 8). Spring 196 is a part of double spool constant torque spring 176 of retractor mechanism 122, best seen in FIG. 8. Double spool constant torque spring 176 includes drive spool 180, first spring spool 192, second spring spool

194, and spring 196, as shown in FIG. 6 through FIG. 8. First spring spool 192 is rotatably coupled to spring mount 178. Second spring spool 194 is rotatably coupled to spring mount 178. Spring 196 is coupled to first spring spool 192, second spring spool 194, and drive spool 180. Spring 196 is configured to provide a constant amount of torque on drive spool 180 as spring 196 unwinds from and winds onto first and second spring spools 192 and 194. Double spool constant torque spring 176 allows retractable extenders 140a and 140b to be wound onto and unwound from first and second cable spools 184 and 186 by pulling on handle 146, as will be explained in further detail shortly.

**[0056]** First and second spring spools 192 and 104 are both rotatably coupled to spring mount 178 in a position between drive spool 180 and top plate 118. This is best seen in FIG. 8. Line 198 extends through top plate 118, the center of first spring spool 192, and the center of drive spool 180. First spring spool 192 is located along line 198 in a position between top plate 118 and drive spool 180, thus first spring spool 192 is coupled to spring mount 178 in a position between drive spool 180 and top plate 118. Line 191 extends through top plate 118, the center of second spring spool 194, and the center of drive spool 180. Second spring spool 192 is located along line 191 in a position between top plate 118 and drive spool 180, thus second spring spool 192 is coupled to spring mount 178 in a position between drive spool 180 and top plate 118.

**[0057]** The relative diameters of first and second spring spools 192 and 194 and drive spool 180 are chosen to provide a suitable extended length of retractable extenders 140 and such that spring 196 can provide a constant amount of torque on drive spool 180 during the entire length of extension and retraction of retractable extenders 140. In the embodiment shown in FIG. 5 through FIG. 8, drive spool diameter  $D_{drive}$  is larger than first spring spool diameter  $D_{first}$  and second spring spool diameter  $D_{second}$ , as shown in FIG. 8. In this embodiment first and second spring spool 192 and 194 have diameters  $D_{first}$  and  $D_{second}$ , respectively, which are approximately the same size. Approximately the same size as used here means that the diameters  $D_{first}$  and  $D_{second}$  are the same value within manufacturing tolerances. Drive spool 180 diameter  $D_{drive}$  is larger than  $D_{first}$  and  $D_{second}$  in this embodiment.

**[0058]** Pulling down on handle 146 will extend retractable extenders 140a and 140b by unwinding retractable extenders 140a and 140b from first and second cable spools 184 and 186, respectively. As retractable extenders 140a and 140b are extended, spring 196 maintains a constant amount of torque on drive spool 180, while allowing drive spool 180, drive shaft 182, and first and second cable spools 184 and 186 to rotate in a direction that unwinds and extends retractable extenders 140a and 140b.

**[0059]** With retractable extenders 140a and 140b extended, items to be stored are placed in storage unit 130.

Extending retractable extenders 140a and 140b puts storage unit 130 closer to the floor for easy access. Once it is desired to retract retractable extenders 140, placing storage unit 130 close to ceiling 112, a tug on handle 146 causes spring 196 to rotate drive spool 180, drive shaft 182, and first and second cable spools 184 and 186 in a direction that retracts retractable extenders 140a and 140b. As drive spool 180, drive shaft 182, and first and second cable spools 184 and 186 rotate in a direction that retracts retractable extenders 140a and 140b, retractable extenders 140a and 140b are wound onto cable spools 184 and 186 respectively. As retractable extenders 140a and 140b are retracted, spring 196 maintains a constant amount of torque on drive spool 180, while allowing drive spool 180, drive shaft 182, and first and second cable spools 184 and 186 to rotate in a direction that retracts retractable extenders 140a and 140b.

**[0060]** Retractor mechanism 122 can take many different forms. The example retrector mechanisms 122 shown in the figures are examples only and not meant to be limiting. Overhead organizer 110 according to the invention can include any type or form of retrector mechanism 122 which retracts and extends the one or more than one retractable extender 140 in order to move storage unit 130 closer to or farther from ceiling 112.

**[0061]** Storage unit 130 according to the invention can take many forms, and be used to store many different items. FIG. 5 shows some example embodiments of storage units 130 that can be coupled to retractable extenders 140. Storage unit 130 can be shelf 134. Shelf 134 can be large or small and take many different forms. Shelf 134 can be used to set items to be stored on. Items to be stored can be clothes, kitchen appliances or utensils, food, tools, or other items. In a particular industrial application overhead organizer 110 is capable of handling heavy weights and shelf 134 can be used to store automobiles, metal, lawn mowers, or other heavy equipment or machinery. In some embodiments storage unit 130 can include shelf 134 as well as other types of storage units 130.

**[0062]** Storage unit 130 can be bar 136 with rings 137. Rings 137 can be used to hang S-hooks 138 or other storage hanger devices. S-hooks 138 can be used to hang bags, clothes, bicycles, tools, kitchen utensils, or other items to be stored or storage containers. In some embodiments rings 137 and S-hooks 138 can be coupled directly to retractable extenders 140 without bar 136.

**[0063]** Storage unit 130 can include clothes cubby 166. FIG. 10 illustrates an embodiment of overhead organizer 110 and storage unit 130, where storage unit 130 includes clothes cubby 166. Clothes cubby 166 can be used to store clothes, shoes, or any other items to be stored on or in the multiple storage areas of clothes cubby 166. In this embodiment clothes cubby 166 is mounted to bar 132, but other mounting configurations are envisioned. In this embodiment clothes cubby 166 is mounted to one half of bar 132, leaving the other half of clothes hanging bar 132 for hanging clothes, towels, or other

items to be stored.

**[0064]** FIG. 11 through FIG 13 illustrate another embodiment of overhead organizer 110. In this embodiment storage unit 130 is box 170. Box 170 is coupled to retractable extenders 140a and 140b using clips 171. Retractable extenders 140a and 140b each pass through a hole in box 170, and are coupled to clips 171, where clips 171 prevent retractable extenders 140a and 140b from being removed from box 170. Box 170 in this embodiment is shown storing sports equipment 164, but it is to be understood that box 170 can be any size, and shape and be used to store any type or size of items to be stored, small or large, light or heavy. In this embodiment retractable extenders 140 can be extended to move box 170 away from ceiling mounted unit 120 as shown in FIG. 11. When box 170 is moved away from ceiling 112, sports equipment 164 can be accessed, removed, or added to box 170 easily. Retractable extenders 140 can be partially retracted to move box 170 towards ceiling 112 as shown in FIG. 12. In this state sports equipment 164 is stored near ceiling 112, making use of space near ceiling 112 and not taking up space on or near the floor.

**[0065]** In the embodiment of overhead organizer 110 as shown in FIG. 11 through FIG. 13, retractable extenders 140 can be fully retracted as shown in FIG. 13. When retractable extenders 140a and 140b are fully retracted in this embodiment, box 170 touches ceiling 112. Ceiling 112 becomes the top of box 170 and prevents dust or other items from entering box 170. In this embodiment storage unit 130 in the form of box 170 encloses ceiling mounted unit 120 in response to retractable extenders 140a and 140b being fully retracted. Encloses in this context means that storage unit 130 covers ceiling mounted unit 120 such that ceiling mounted unit 120 is hidden from view from a person standing on the floor. Storage unit encloses ceiling mounted unit 120 such that storage unit 130 covers the sides and bottom of ceiling mounted unit 120. Ceiling 112 covers ceiling mounted unit from the top side, thus when retractable extenders 140 are fully retracted in this embodiment, ceiling mounted unit 120 is enclosed on all sides. Thus in this embodiment box 170 hides ceiling mounted unit 120, making overhead organizer 110 in this embodiment compact. Box 170 can be fashionably designed to add decorative features to overhead organizer 110. In this embodiment overhead organizer takes up minimal space, what space it does consume is little-used space near ceiling 112, and overhead organizer 110 can complement the decorative features of ceiling 112.

**[0066]** FIG. 14 shows method 310 of forming an overhead organizer according to the invention. Method 310 of forming an overhead organizer 310 according to the invention includes several steps. Method 310 includes step 312 of attaching a ceiling mounted unit to a ceiling, where the ceiling mounted unit comprises a retrector mechanism and a retrector motor, and where the retrector mechanism is operated by the retrector motor. Method 310 also includes step 314 of coupling a retractable ex-

tender to the retractor mechanism, where the length of the retractable extender is adjusted by the retractor mechanism. Method 310 includes step 316 of coupling a storage unit to the retractable extender, where the distance between the storage unit and the ceiling is adjusted in response to adjusting the length of the retractable extender. And method 310 includes step 318 of wirelessly electronically coupling a remote control unit to the retractor motor, where the retractor motor instructs the retractor mechanism to adjust the length of the retractable extender in response to receiving a command from the remote control unit.

**[0067]** Method 310 of forming an overhead organizer can include many other steps. In some embodiments method 310 includes the step of forming a ceiling mounted unit. In some embodiments method 310 includes the step of forming a retractor mechanism. In some embodiments method 310 includes the step of forming a storage unit. In some embodiments method 310 includes the step of coupling a retractor motor to the retractor mechanism.

**[0068]** Step 312 of attaching a ceiling mounted unit to a ceiling, where the ceiling mounted unit comprises a retractor mechanism and a retractor motor, and where the retractor mechanism is operated by the retractor motor, can include many other steps. In some embodiments step 312 includes coupling the retractor motor to the retractor mechanism such that the retractor motor rotates the retractor mechanism. In some embodiments step 312 includes coupling a mounting plate to the ceiling, and coupling the ceiling mounted unit to the mounting plate. In some embodiments step 312 includes coupling a mounting plate to the ceiling, and coupling a top plate to the ceiling mounted unit to the mounting plate.

**[0069]** Step 316 of coupling a storage unit to the retractable extender, where the distance between the storage unit and the ceiling is adjusted in response to adjusting the length of the retractable extender, can include many other steps. In some embodiments step 316 includes coupling a box storage unit to the retractable extender, where the ceiling becomes the top of the box when the retractable extender is in the fully retracted position. In some embodiments step 316 includes the step of coupling a box storage unit to the retractable extender, where the box storage unit encloses the ceiling mounted unit when the retractable extender is in the fully retracted position.

**[0070]** FIG. 15 shows method 410 of forming an overhead organizer according to the invention. Method 410 of forming an overhead organizer according to the invention includes several steps. Method 410 includes step 412 of forming a ceiling mounted unit, wherein the ceiling mounted unit is configured to be coupled to a ceiling. Method 410 of forming an overhead organizer according to the invention also includes step 414 of coupling a retractor mechanism to a top plate of the ceiling mounted unit. Method 410 of forming an overhead organizer according to the invention also includes step 416 of coupling

one or more than one retractable extender to the retractor mechanism. Method 410 of forming an overhead organizer according to the invention also includes step 418 of coupling a storage unit to the one or more than one retractable extender, where the storage unit moves closer or farther away from the ceiling mounted unit in response to the retractor mechanism extending or retracting, respectively, the one or more than one retractable extender. In some embodiments the storage unit touches the ceiling in response to each of the one or more than one retractable extenders being fully retracted. In some embodiments the storage unit encloses the ceiling mounted unit in response to each of the one or more than one retractable extenders being fully retracted.

**[0071]** Method 410 of forming an overhead organizer can include many other steps. In some embodiments method 410 includes the step of forming a retractor mechanism. In some embodiments method 410 includes the step of forming a storage unit. In some embodiments method 410 includes the step of coupling a retractor motor to the retractor mechanism. In some embodiments the step of forming a retractor mechanism includes the step of coupling a double spool constant torque spring to a spring mount. In some embodiments the step of forming a retractor mechanism includes the step of coupling the spring mount to a top plate. In some embodiments the step of forming a retractor mechanism includes the step of coupling a drive shaft to the double spool constant torque spring.

**[0072]** Step 412 of forming a ceiling mounted unit can include many other steps. In some embodiments step 412 includes forming a top plate such that the top plate is configured to couple to a ceiling. In some embodiments step 412 includes forming a mounting plate such that the mounting plate is configured to couple to a ceiling. In some embodiments step 412 includes forming a top plate such that the top plate is configured to couple to the mounting plate.

**[0073]** Step 414 of coupling a retractor mechanism to a top plate of the ceiling mounted unit can include many other steps. In some embodiments step 414 of coupling a retractor mechanism to a top plate of the ceiling mounted unit comprises the step of coupling a spring mount to the top plate. In some embodiments step 414 of coupling a retractor mechanism to a top plate of the ceiling mounted unit comprises the step of coupling a double spool constant torque spring to the spring mount. In some embodiments step 414 of coupling a retractor mechanism to a top plate of the ceiling mounted unit comprises the step of coupling a drive shaft to a drive spool of the double spool constant torque spring, wherein the drive shaft rotates with respect to the spring mount, and wherein each of the one or more than one retractable extenders is either extended or retracted in response to rotation of the drive shaft. In some embodiments step 414 of coupling a retractor mechanism to a top plate of the ceiling mounted unit comprises the step of coupling one or more than one cable spool to the drive shaft. In some embodiments step

414 of coupling a retractor mechanism to a top plate of the ceiling mounted unit comprises the step of coupling one or more than one retractable extender to the one or more than one cable spool.

**[0074]** In some embodiments step 414 of coupling a retractor mechanism to a top plate of the ceiling mounted unit comprises the step of coupling a first cable spool to a first end of the drive shaft. In some embodiments step 414 of coupling a retractor mechanism to a top plate of the ceiling mounted unit comprises the step of coupling a first retractable extender to the first cable spool. In some embodiments step 414 of coupling a retractor mechanism to a top plate of the ceiling mounted unit comprises the step of coupling a second cable spool to a second end of the drive shaft. In some embodiments step 414 of coupling a retractor mechanism to a top plate of the ceiling mounted unit comprises the step of coupling a second retractable extender to the second cable spool.

**[0075]** In some embodiments the step of coupling a double spool constant torque spring to the spring mount comprises the step of coupling a drive spool to the spring mount. In some embodiments the step of coupling a double spool constant torque spring to the spring mount comprises the step of coupling a first spring spool to the spring mount. In some embodiments the step of coupling a double spool constant torque spring to the spring mount comprises the step of coupling a second spool to the spring mount. In some embodiments the step of coupling a double spool constant torque spring to the spring mount comprises the step of coupling a spring to the drive spool, the first spring spool, and the second spring spool, wherein the spring controls the rotational torque applied to the drive spool. In some embodiments the step of coupling a first spring spool to the spring mount comprises the step of coupling a first spring spool to the spring mount such that the first spring mount is located between the drive shaft and the top plate. In some embodiments the step of coupling a second spring spool to the spring mount comprises the step of coupling a second spring spool to the spring mount such that the second spring mount is located between the drive shaft and the top plate.

**[0076]** The embodiments and examples set forth herein were presented in order to best explain the present invention and its practical application and to thereby enable those of ordinary skill in the art to make and use the invention. However, those of ordinary skill in the art will recognize that the foregoing description and examples have been presented for the purposes of illustration and example only. The description as set forth is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the teachings above.

## Claims

1. An overhead organizer comprising:

a ceiling mounted unit comprising:

a top plate, wherein the top plate is configured to be coupled to a ceiling; and a retractor mechanism coupled to the top plate;

a storage unit, wherein the storage unit holds an item to be stored; a first retractable extender; and a second retractable extender; wherein the first and the second retractable extenders retractably couple the storage unit to the ceiling mounted unit; and wherein the retractor mechanism extends and retracts the first and the second retractable extenders.

20. 2. The overhead organizer of claim 1, wherein the retractor mechanism comprises:

a spring mount coupled to the top plate; a drive spool rotatably coupled to the spring mount; a drive shaft fixedly coupled to drive spool, wherein the drive shaft rotates in response to rotation of the drive spool; a first cable spool fixedly coupled to the drive shaft, wherein:

the first cable spool rotates in response to rotation of the drive shaft; and the first retractable extender unwinds from and winds onto the first cable spool to extend and retract, respectively the first retractable extender;

and

a second cable spool fixedly coupled to the drive shaft, wherein:

the second cable spool rotates in response to rotation of the drive shaft; and the second retractable extender unwinds from and winds onto the second cable spool to extend and retract, respectively the second retractable extender.

3. The overhead organizer of claim 2, wherein:

the first cable spool is fixedly coupled to a first end of the drive shaft; the second cable spool is fixedly coupled to a second end of the drive shaft; and the drive shaft extends through the drive spool

such that the drive spool is positioned along the drive shaft in a location between the first cable spool and the second cable spool.

4. The overhead organizer of claim 2, wherein the retractor mechanism further comprises: 5

a first spring spool rotatably coupled to the spring mount;

a second spring spool rotatably coupled to the spring mount; 10

and

a spring coupled to each of:

the first spring spool; 15

the second spring spool;

and

the drive spool;

wherein the spring provides a constant amount 20

of torque on the drive spool as the drive spool rotates.

5. The overhead organizer of claim 4, wherein the first 25

spring spool is coupled to the spring mount in a position between the drive spool and the top plate.

6. The overhead organizer of claim 5, wherein the second 30

spring spool is coupled to the spring mount in a position between the drive spool and the top plate.

7. The overhead organizer of claim 4, wherein: 35

the first spring spool has a first spring spool diameter;

the second spring spool has a second spring spool diameter;

the drive spool has a drive spool diameter;

the drive spool diameter is larger than the first 40

spring spool diameter;

and

the drive spool diameter is larger than the second spring spool diameter.

8. The overhead organizer of claim 7, wherein the first 45

spring spool diameter is approximately equal to the second spring spool diameter.

9. The overhead organizer of claim 1, further comprising 50

a wireless remote control unit, wherein the retractor mechanism extends and retracts the first and the second retractable extenders in response to receiving a wireless communication from the wireless remote control unit.

10. A method of forming an overhead organizer, the 55

method comprising the steps of:

forming a ceiling mounted unit, wherein the ceiling mounted unit is configured to be coupled to a ceiling;

coupling a retractor mechanism to a top plate of the ceiling mounted unit;

coupling one or more than one retractable extender to the retractor mechanism;

and

coupling a storage unit to the one or more than one retractable extender;

wherein the storage unit moves closer or farther away from the ceiling mounted unit in response to the retractor mechanism retracting or extending, respectively, the one or more than one retractable extender.

11. The method of claim 10, wherein the step of coupling a retractor mechanism to a top plate of the ceiling mounted unit comprises the steps of: 20

coupling a spring mount to the top plate;

coupling a double spool constant torque spring to the spring mount;

and

coupling a drive shaft to a drive spool of the double spool constant torque spring, wherein the drive shaft rotates with respect to the spring mount, and wherein each of the one or more than one retractable extenders is either extended or retracted in response to rotation of the drive shaft .

12. The method of claim 11, wherein the step of coupling a double spool constant torque spring to the spring mount comprises the steps of: 30

coupling a drive spool to the spring mount;

coupling a first spring spool to the spring mount;

coupling a second spool to the spring mount;

and

coupling a spring to the drive spool, the first spring spool, and the second spring spool, wherein the spring controls the rotational torque applied to the drive spool.

13. The method of claim 12, wherein the step of coupling a first spring spool to the spring mount comprises the step of coupling a first spring spool to the spring mount such that the first spring mount is located between the drive shaft and the top plate. 40

14. The method of claim 10, wherein the storage unit touches the ceiling in response to each of the one or more than one retractable extenders being fully retracted. 45

15. The method of claim 10, wherein the storage unit encloses the ceiling mounted unit in response to

each of the one or more than one retractable extenders being fully retracted.

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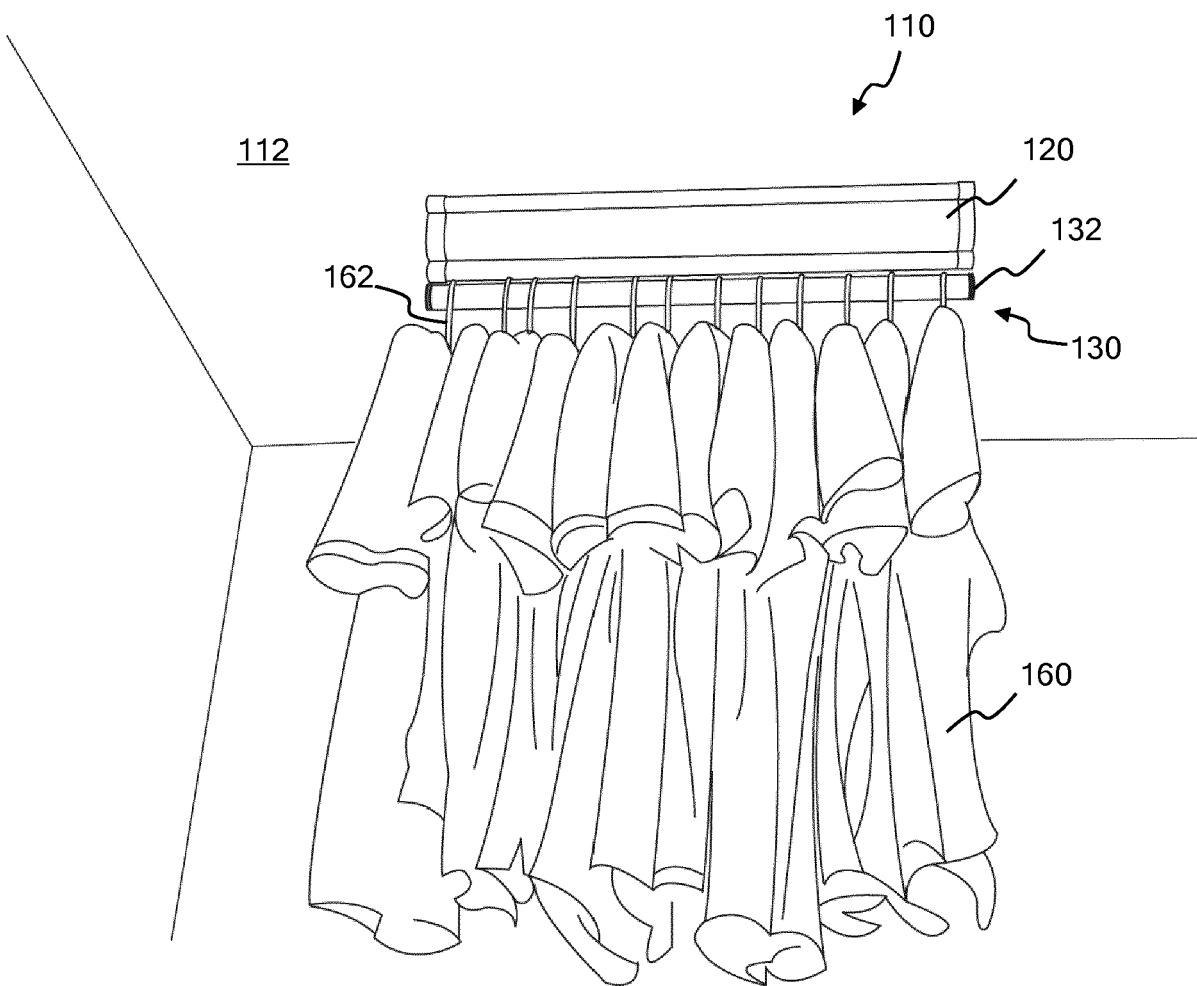


FIG. 1

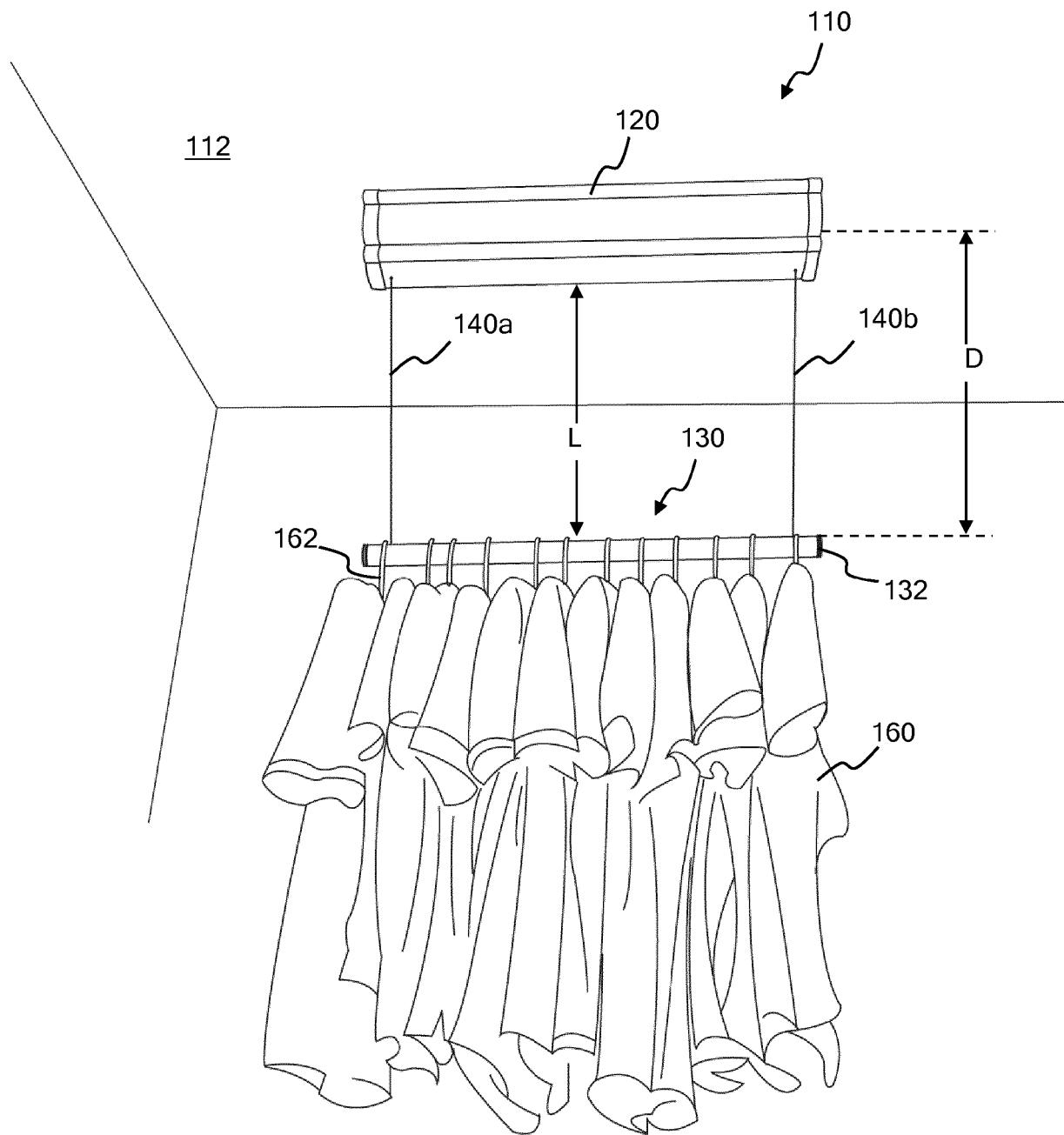


FIG. 2

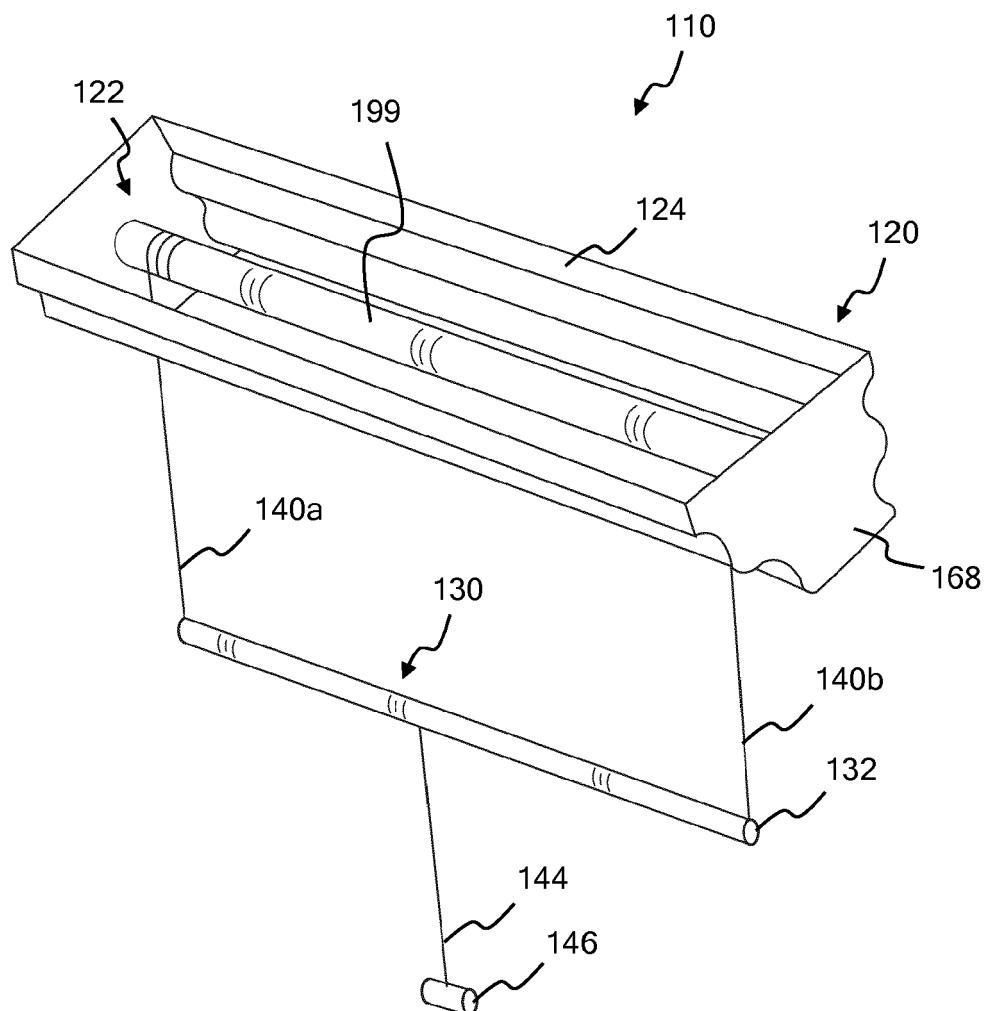
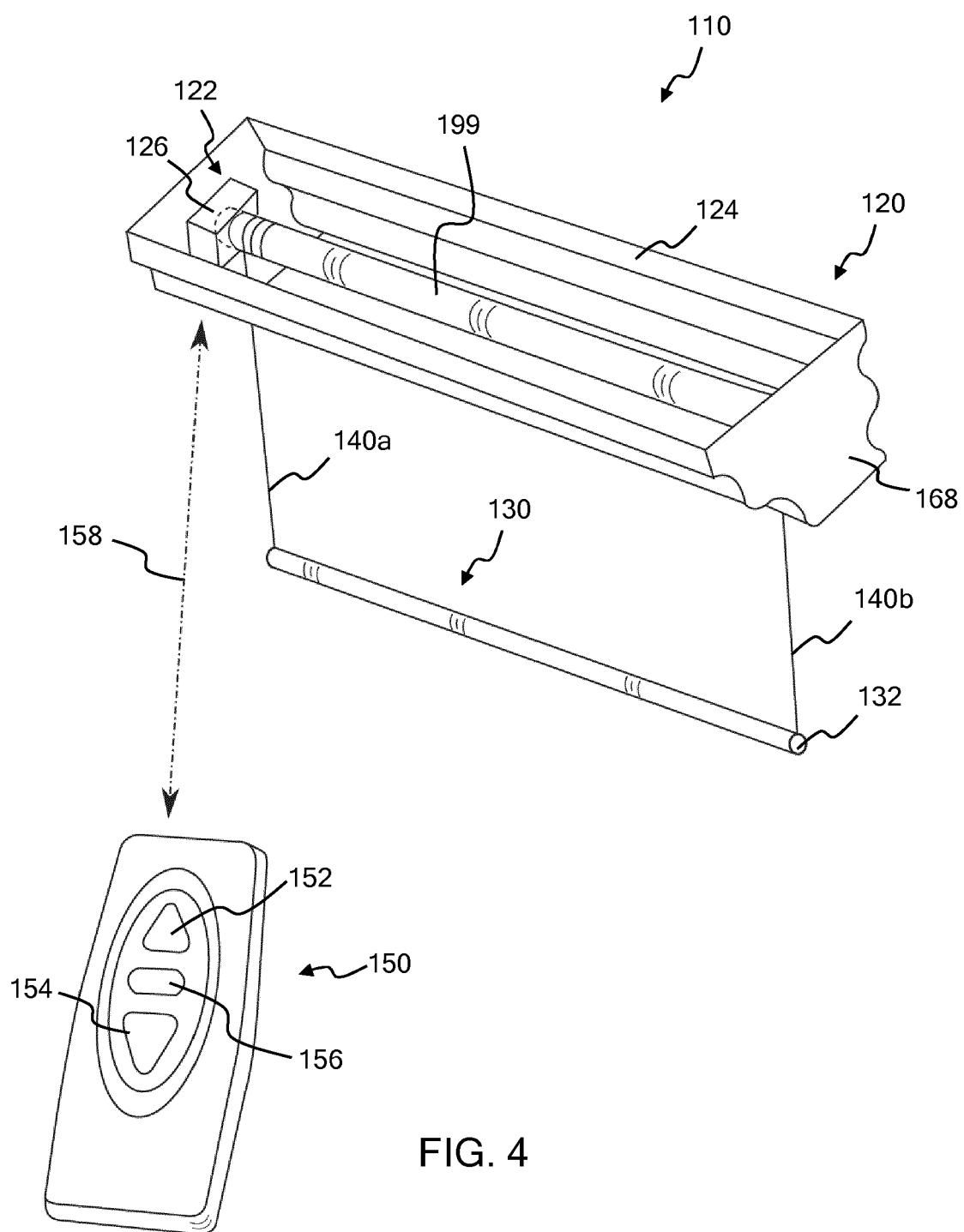


FIG. 3



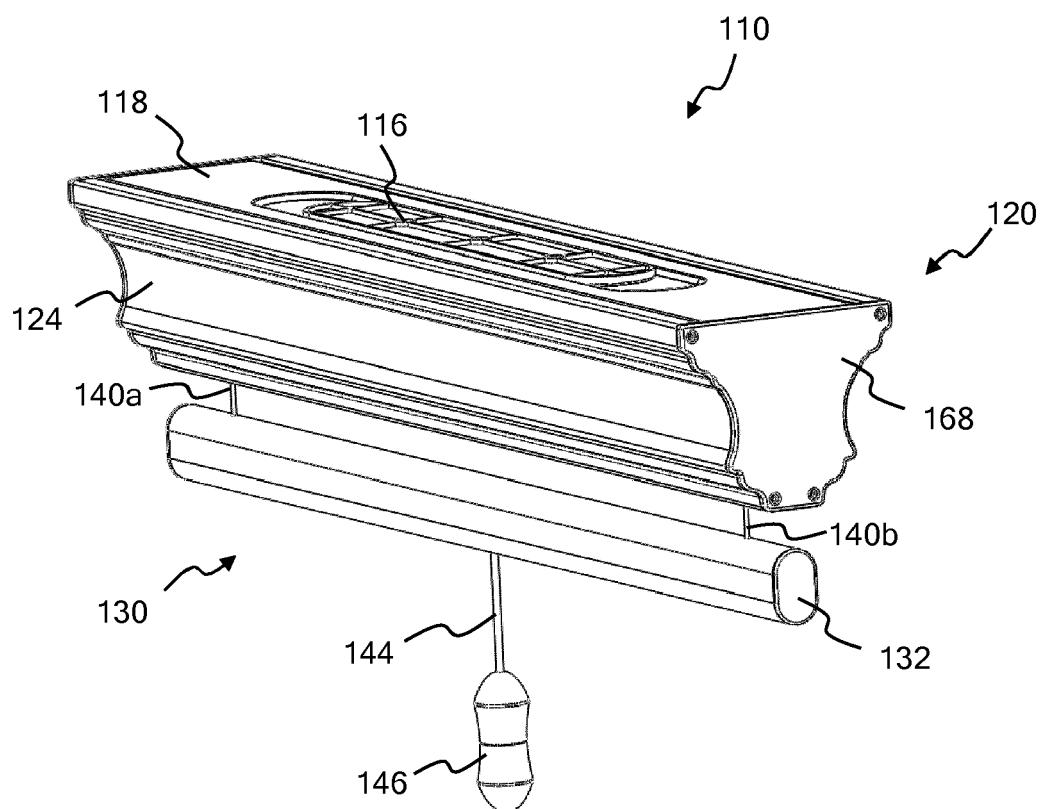


FIG. 5

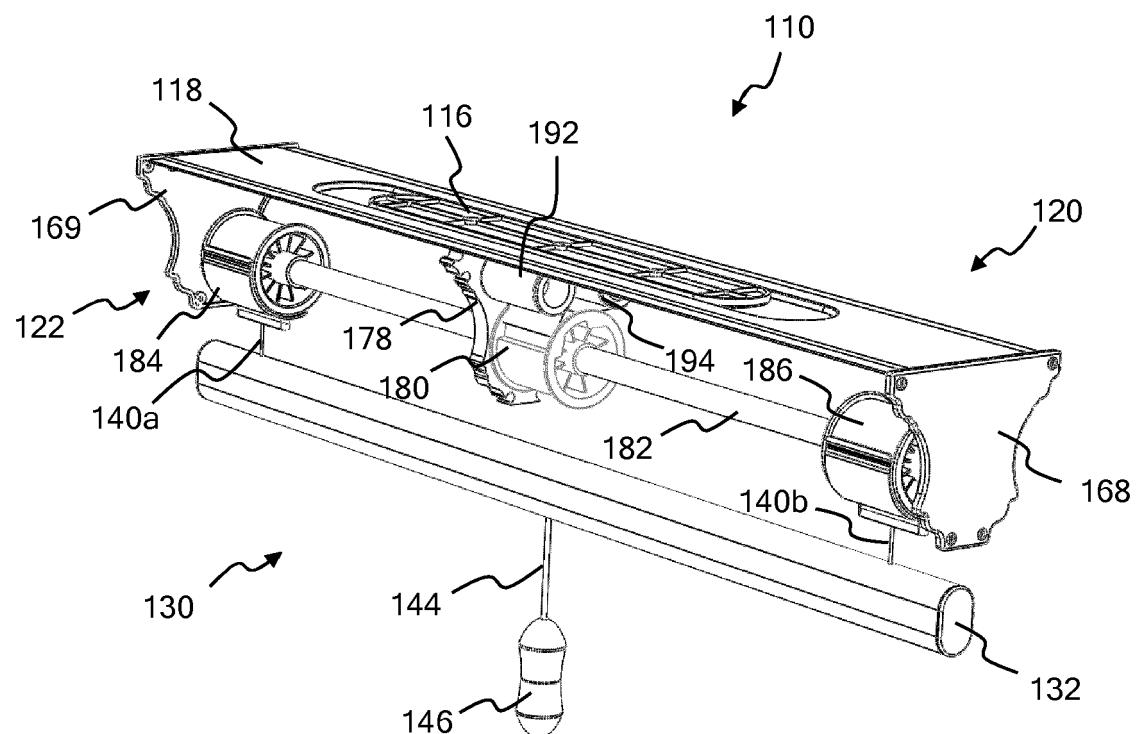


FIG. 6

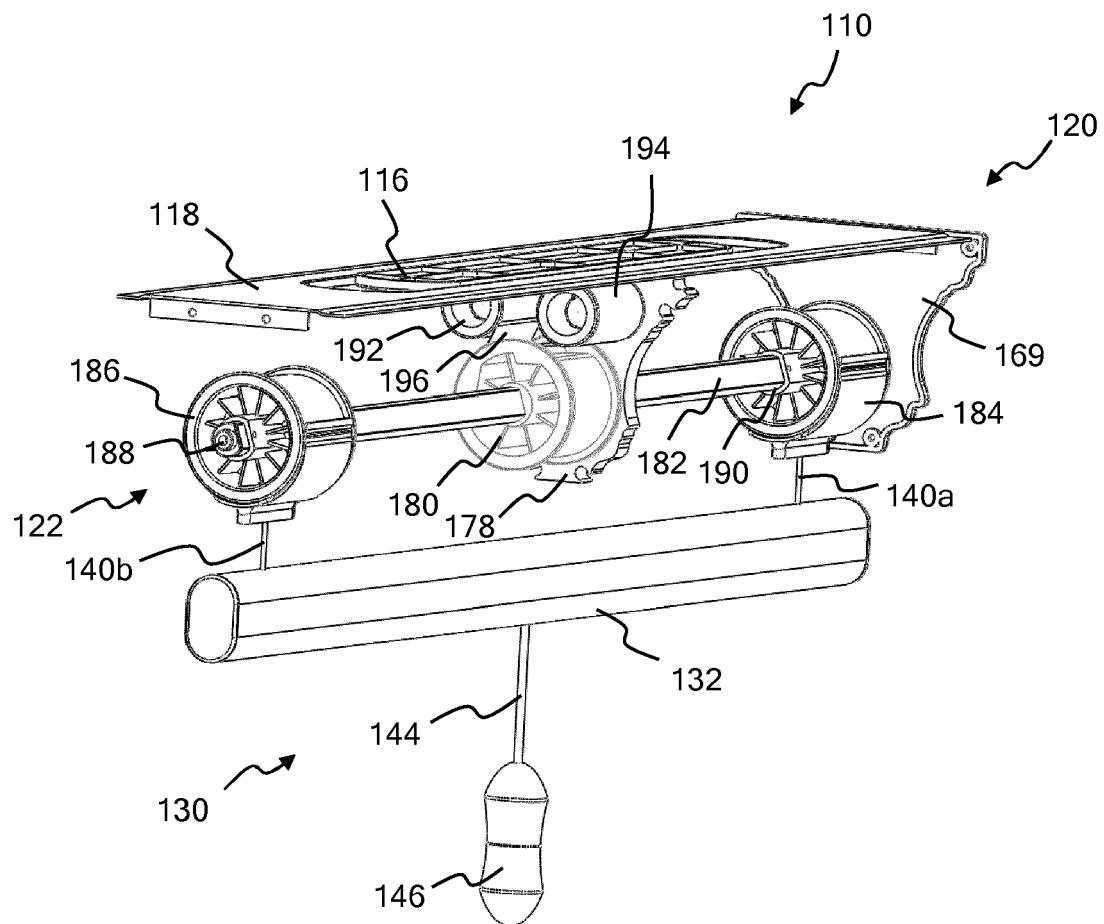


FIG. 7

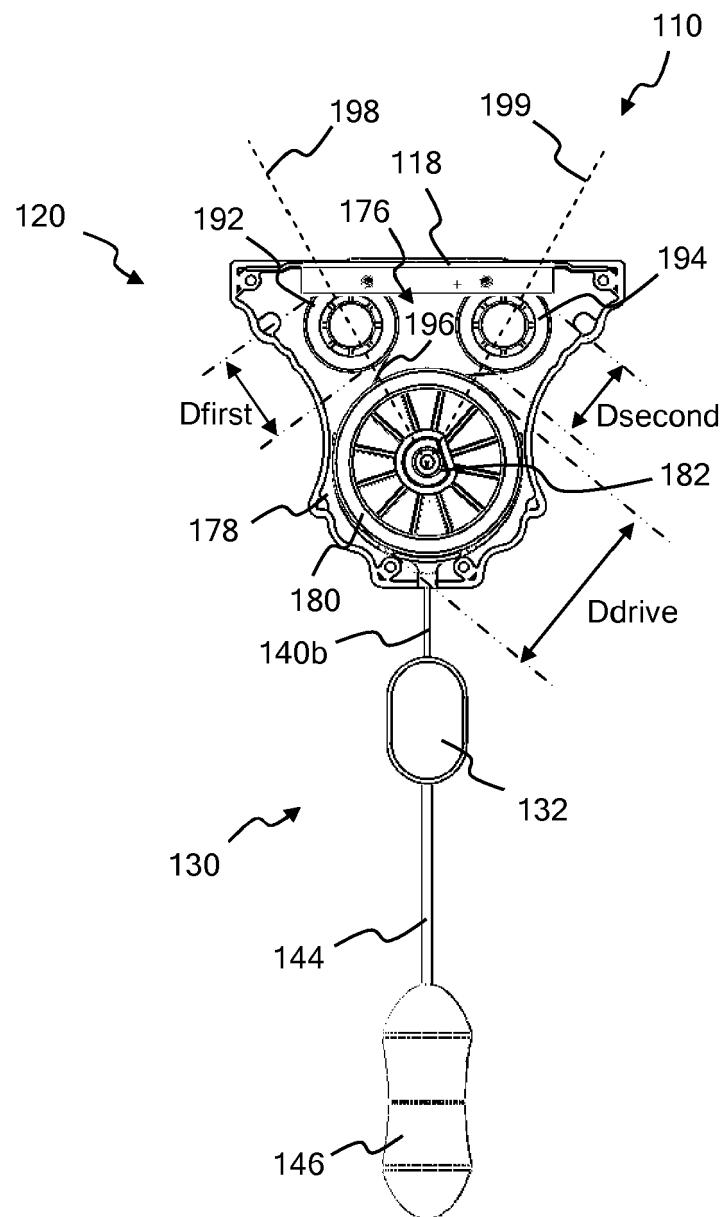


FIG. 8

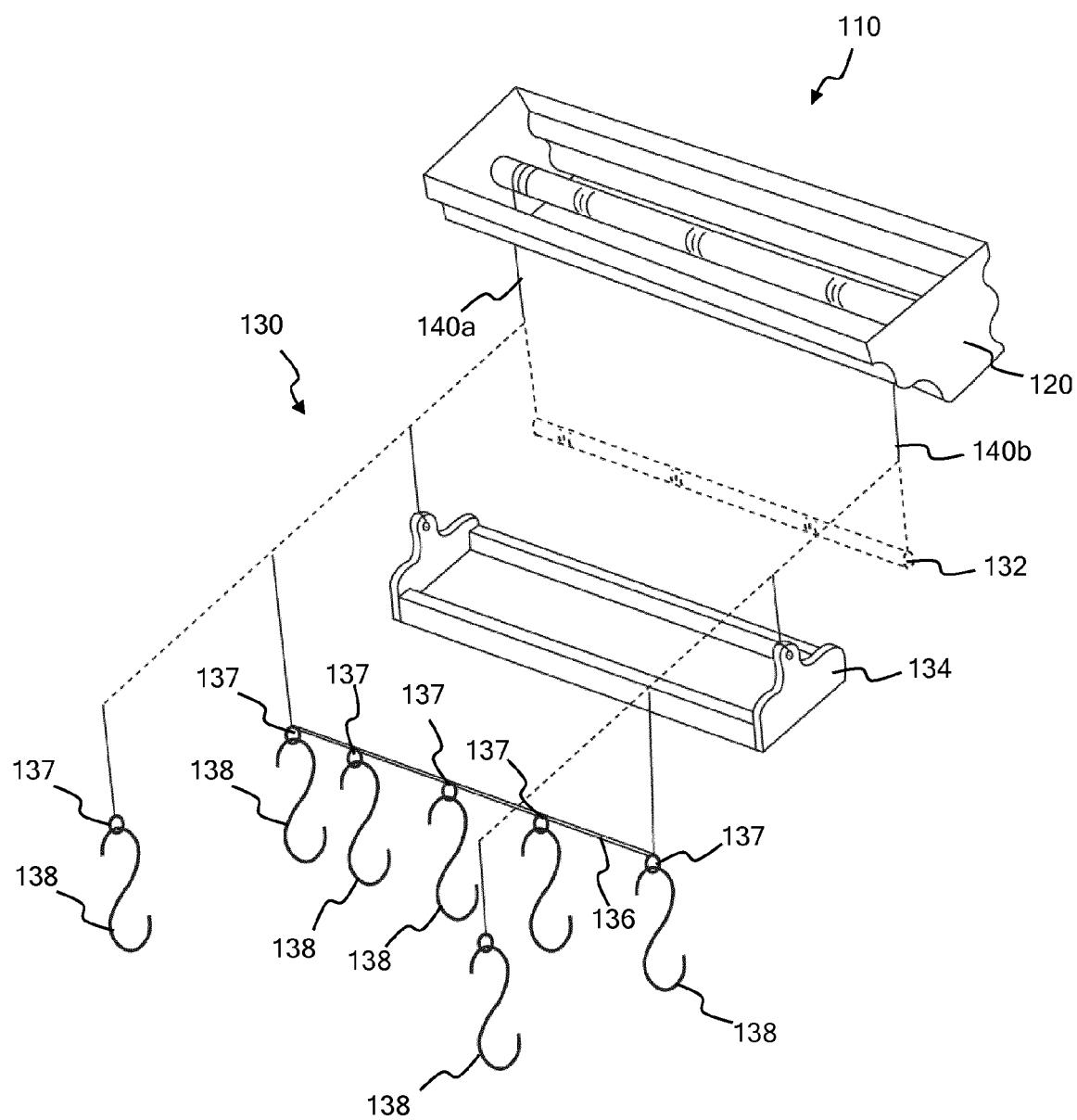


FIG. 9

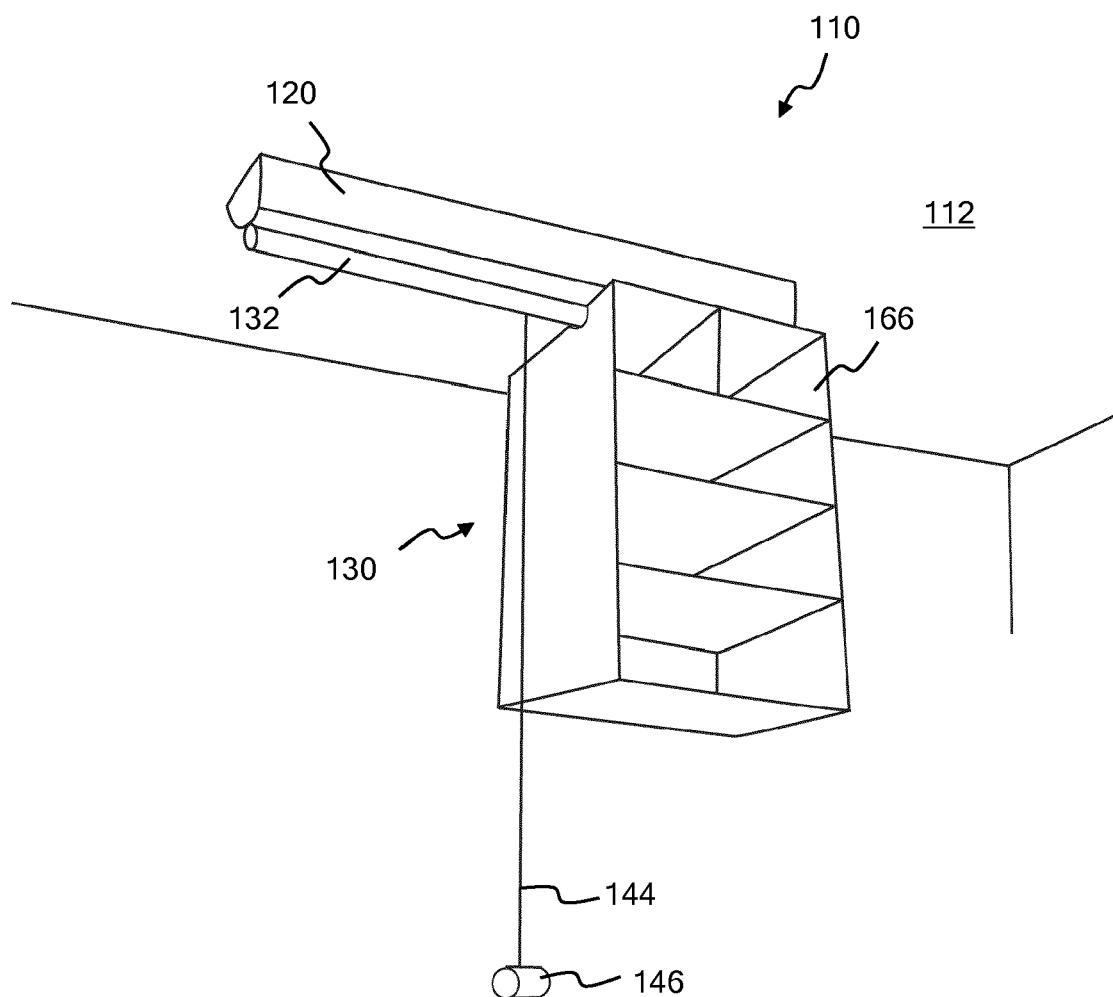


FIG. 10

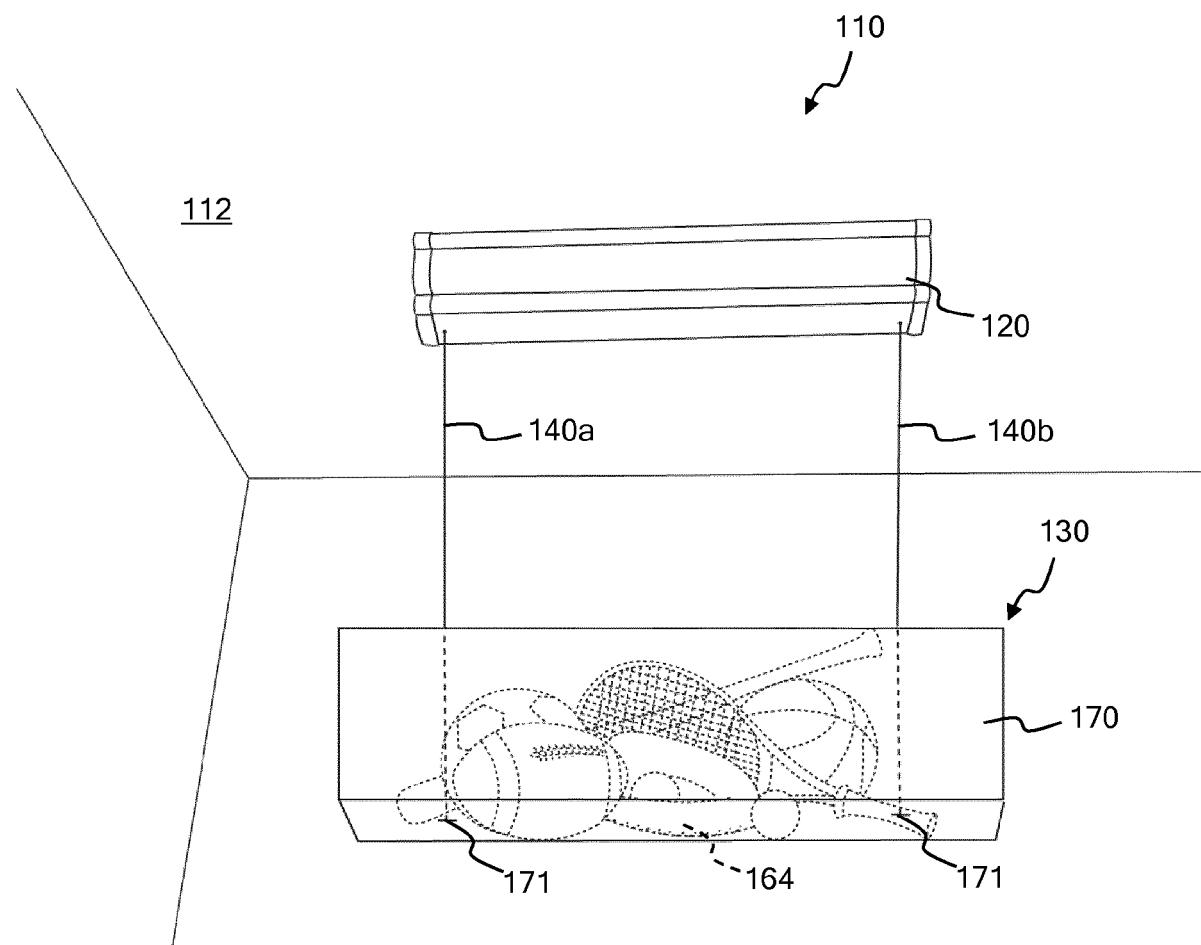


FIG. 11

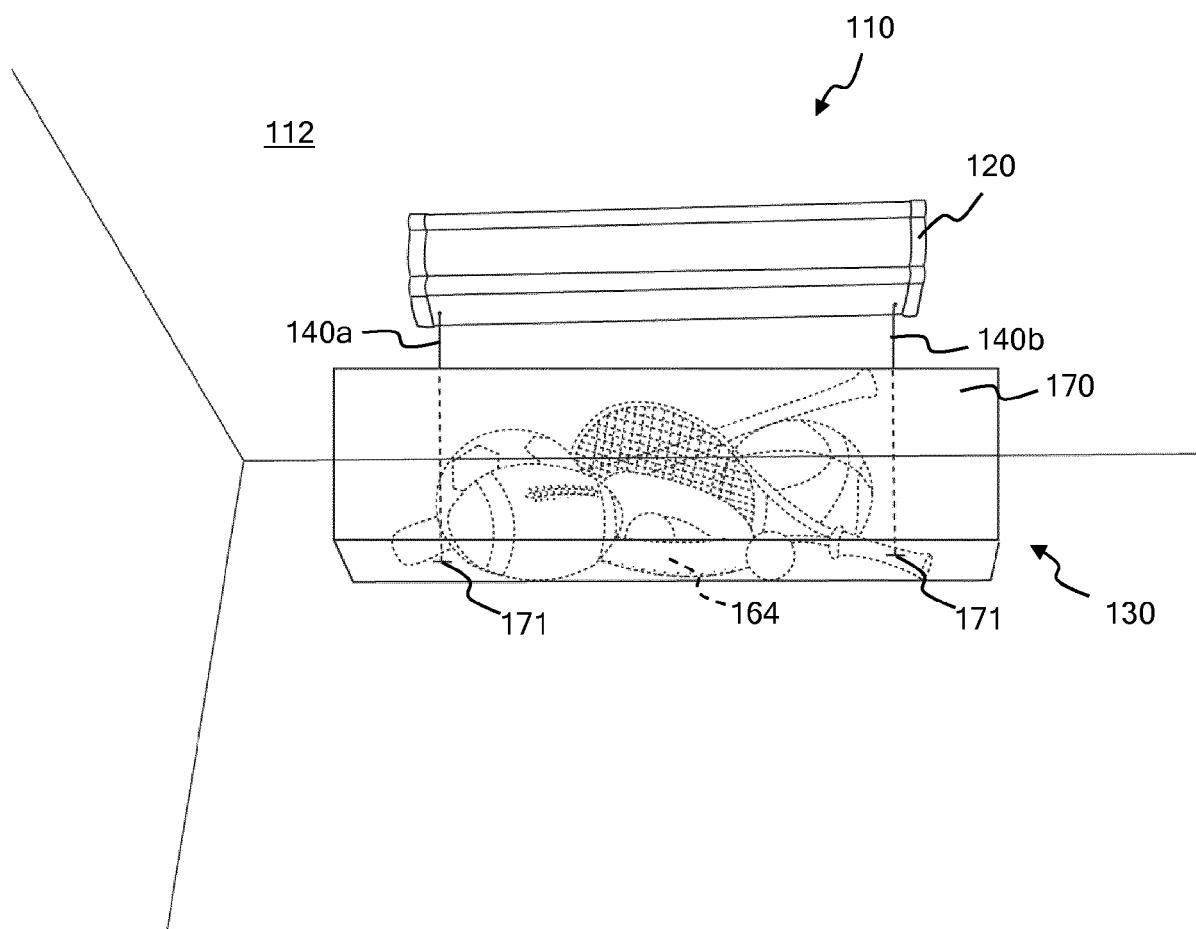
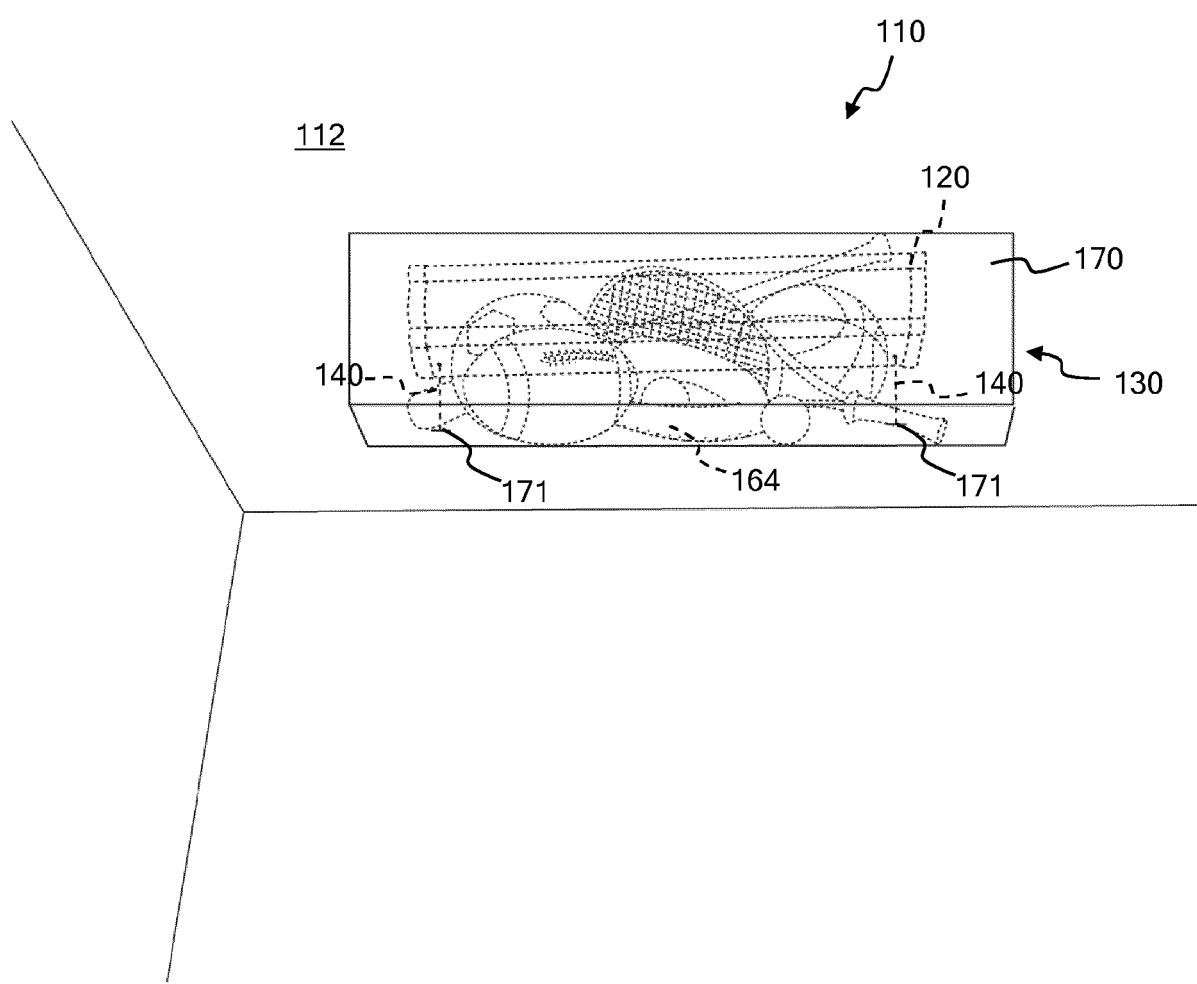


FIG. 12



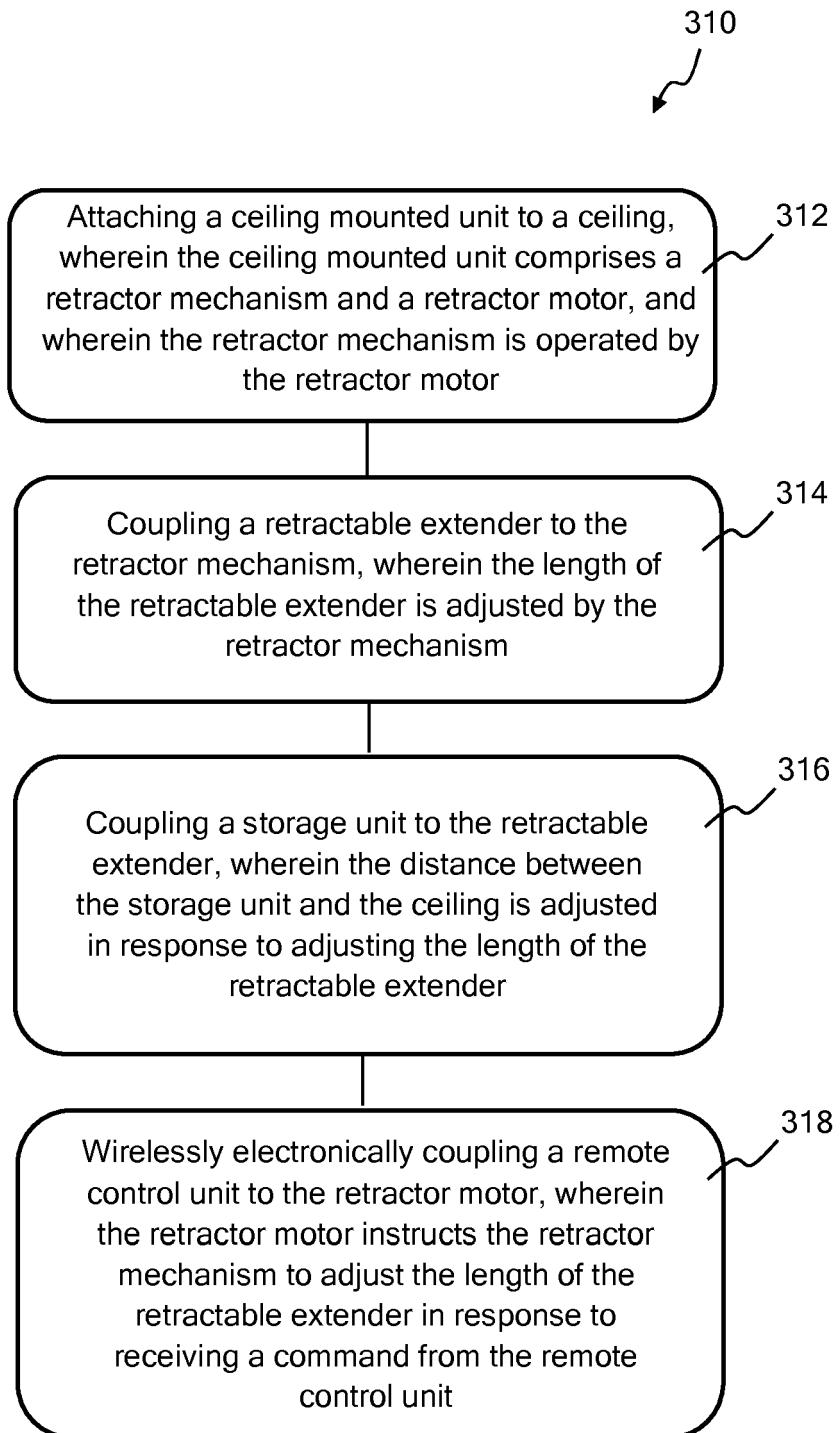


FIG. 14

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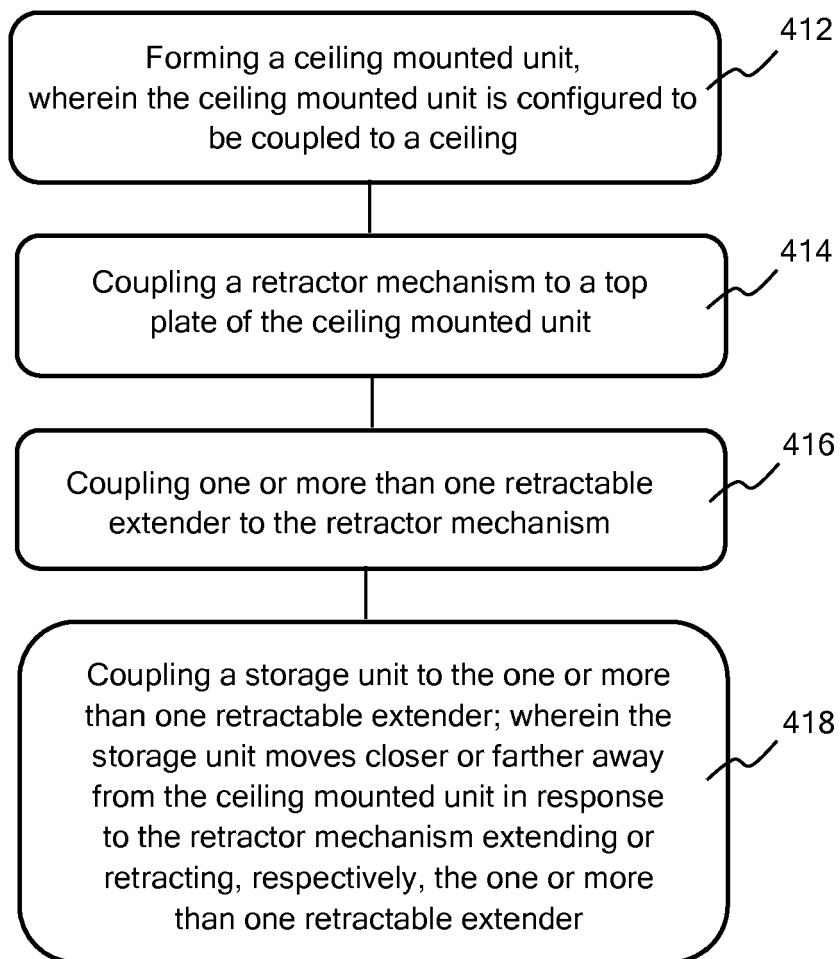


FIG. 15



## EUROPEAN SEARCH REPORT

Application Number

EP 13 16 2726

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	US 599 871 A (JOHN L. SIEFKES) 1 March 1898 (1898-03-01)	1	INV. A47B43/00 A47B51/00
A	* page 1 - page 2; figures 1,2,3 *	2-15	-----
X	US 596 176 A (LIDA HALL NAYLOR) 28 December 1897 (1897-12-28)	1	
A	* page 1 - page 2; figures 1,2 *	2-15	-----
X	DE 295 02 551 U1 (STOLTENBERG LERCHE SVEN [DE]) 13 July 1995 (1995-07-13)	1	
A	* page 3, line 22 - page 4, line 23; figures 1,2 *	2-15	-----
			TECHNICAL FIELDS SEARCHED (IPC)
			A47B
The present search report has been drawn up for all claims			
1	Place of search	Date of completion of the search	Examiner
	Munich	1 July 2013	Klintebäck, Daniel
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T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 13 16 2726

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01-07-2013

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 599871	A	01-03-1898	NONE	
US 596176	A	28-12-1897	NONE	
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**REFERENCES CITED IN THE DESCRIPTION**

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