



(11) **EP 2 014 189 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
14.01.2009 Bulletin 2009/03

(51) Int Cl.:
A45C 13/00 ^(2006.01) **A45C 13/26** ^(2006.01)
A45F 3/04 ^(2006.01) **A45C 3/02** ^(2006.01)
A45C 3/06 ^(2006.01)

(21) Application number: **08104671.6**

(22) Date of filing: **08.07.2008**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**
Designated Extension States:
AL BA MK RS

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(30) Priority: **09.07.2007 US 948548 P**

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(54) **A carrier device having adjustable strap and the usage thereof**

(57) The present invention provides a carrier device (200) having an adjustable strap (220) comprising a carrier body (210), at least one strap (220) and a reel device (10) is provided. At least one strap (220) movably disposed on one side of the carrier body (210). The reel device (10) disposed at one side of the carrier body (210), the reel device (10) having at least one spool (14), at least one retractable wire (18a) and a latch (16). The

retractable wire (18a) is coiled on the spool (14) and the latch (16) is disposed on the reel device (10) and releasably limits a relative movement between the retractable wire (18a) and the spool (14) which allows an user to quickly and easily adjust the length of the strap (220) to the desired length.

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] This invention relates to a carrier device having a retractable wire for the adjustment of the strap on the carrier device to a suitable length.

2. Description of the Prior Art

[0002] In general, a carrying bag includes a handbag, a messenger bag, a briefcase or a backpack. The known means to adjust the strap on a carrying bag normally includes various parts (such as a strap hook, a buckle, a clamp, etc.) for adjusting the length of the strap. As for the backpack having a buckle or a strap hook, if the length is to be adjusted, the user is normally required to first pull the strap from the strap hook and release the limit on the strap, and then gradually stretch or retract the strap.

[0003] However, the above-mentioned approach users may require time and effort to adjust the length of the strap in order for the strap to fit the user's body and to obtain comfort. Furthermore, the straps in the prior art may not be suitably adjusted correspondingly to the user's body in order to provide comfort and expected length.

[0004] Furthermore, the prior art includes a carrying bag having an adjustable strap. The carrying bag also includes buckles disposed on two sides of the carrying bag for limiting or releasing the relative movement between the adjustable strap and the carrying bag. The adjustable strap is connected to a coil spring disposed at the bottom of the baggage and can be movably wound around the bottom of the baggage. Thus when the adjustable strap is stretched, the coil spring will store a resilience force for the adjustable strap to retract back to its original length. However, in the above-mentioned structure, the coil spring will limit the reduction of the baggage's size and the structure needs to be applied in the carrying bag made of rigid material to avoid possible structural damages.

[0005] Thus the community needs an improved strap to be used in handbags, messenger bags, briefcases, backpacks or other small carrier devices.

SUMMARY OF THE INVENTION

[0006] It is an objective of the present invention to provide a carrier device having adjustable strap. The carrier device has the function of adjusting the length of a strap quickly and effectively.

[0007] It is another objective of the present invention to provide a carrier device having adjustable strap. The carrier device is suitable for the use in various small carrying bags.

[0008] It is yet another objective of the present invention to provide an usage of the carrier devices having

adjustable strap. The usage allows the user to quickly and easily adjust the strap to a suitable length.

[0009] The present invention provides a novel and improved carrier having adjustable strap and the usage thereof. The carrier device is adjusted and positioned on user's handbags, messenger bags, backpacks, briefcases or other small carrying bags. In some embodiments, the user may switch the position from carrying the carrier device on a shoulder to carrying the carrier device by hand without releasing any buckle, button, hook or other similar devices.

[0010] The present invention provides a carrier device having adjustable strap. The carrier device includes a carrier body, at least one strap and a reel device. The strap can be movably connected to one side of the carrier body. The reel device is disposed on one side of the carrier body. The reel device has at least one spool, at least one retractable wire and a latch. The retractable wire is connected to one side of the strap and is then coiled on the spool. The latch device is disposed on the reel device and can releasably limit the relative movement between the retractable wire and the spool.

[0011] In more preferred embodiment, the carrier device further includes a guiding device and a connecting device. The guiding device is disposed on at least one side of the reel device and stretching to at least one side of the carrier body and guides the retractable wire between the reel device and the strap. The guiding device further includes two parallel and spaced guiding portions. The guiding portions can be made of a tube or other tube-shaped elements and can be disposed respectively in two concavities on a surface of the carrier body. However, in other embodiments, two guiding portions can include a trough protruding from the surface of the carrier body. The connecting device is disposed at one end of the strap and the retractable wire can be movably connected to the connecting device.

[0012] In another preferred embodiment, the reel device further includes a casing. The spool further includes a plurality of first teeth and at least one groove. The groove is formed on a circumferential side of the spool. One end of the retractable wire can movably pass one end of the strap to coil in the groove while another end is fixed on the casing. One end of the strap or the connecting device further includes a pulley for the retractable wire to movably pass through. The retractable wire further includes a first retractable wire and a second retractable wire. One end of the first retractable wire and one end of the second retractable wire are respectively coiled in the first spool and the second spool; another end of the first retractable wire and another end of the second retractable wire are fixed on one side of the carrier body. The spool includes a spiral spring. The latch device has a plurality of second teeth corresponding to part of the first teeth. The above-mentioned first teeth are distributed on an inner rim on one side of the spool. The spiral spring is disposed in a space opposite to the side of the spool having the first teeth.

[0013] The casing further includes a pivot, a first casing, a second casing, an opening and a guiding slot. The spool has a hole for accommodating the pivot. The latch further includes a stopper block, at least one helix spring and a hook portion. The first casing has at least one assembly column and the second casing has at least one assembly hole for coupling with the assembly column. The latch device has at least one fin disposed on at least one lateral side of the latch device. The fin of the latch device is disposed in the guiding slot for the latch device to be movably positioned the latch device on the opening. An end of the helix spring contacts with the casing while another end of the helix spring contacts with the stopper block for returning the latch device to its initial position. The hook portion further includes a protrusion formed at one end of the hook portion. The stopper block includes a stopper opening and a stopper skirt disposed at one end of the stopper opening. The stopper opening accommodates the hook portion and positions the protrusion on the stopper skirt.

[0014] The present invention further includes a carrier device having a retractable wire. The carrier device further includes a carrier body, at least one strap and a reel device. The strap has two ends and the two ends can be movably connected to one side of the carrier body. The reel device is disposed on the bottom of the carrier body. The reel device has at least one spool, a first retractable wire, a second retractable wire. The first retractable wire is connected to one end of the strap while the second retractable wire is connected to another end of the strap. The first retractable wire and the second retractable wire are coiled in the spool. The latch device is disposed on the reel device and can releasably limit the relative movement between the retractable wire and the spool for the user to quickly and easily adjust the strap to a suitable length.

[0015] The present invention also provides a usage of the carrier device having a retractable wire, wherein the carrier device further includes a carrier body, a strap movably connected to one side of the carrier body and a reel device. The reel device is disposed at the bottom of the carrier body. The reel device has a spool, at least one retractable wire and a latch device. The retractable wire is coiled in the spool. The latch device is disposed on the reel device, and can releasably limit the relative movement between the spool and the retractable wire. The usage of the carrier device includes first pressing the latch device to release the limit on the relative movement between the spool and the retractable wire, adjusting the length of which the strap stretching from the carrier device, and releasing the latch device to limit the relative movement between the spool of the reel device and the retractable wire in order to refrain the strap from stretching or retracting for the user to carry.

[0016] In more preferred embodiments, the step of adjusting the strap includes applying a force on the strap and simultaneously pressing the latch device to extend the length of which the strap stretching from the carrier

device or pressing the latch device and simultaneously releasing the force on the strap which allows the strap to retract and connects with the carrier device. Furthermore, while pressing the latch device, one end of the retractable wire passes one end of the strap and guides the strap towards or away from the other end of the retractable wire.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Fig. 1 is a perspective view illustrating the first embodiment of the reel device of the present invention;

[0018] Fig. 2 is a perspective view illustrating the first embodiment of the carrier device of the present invention;

[0019] Fig. 3 is a perspective view illustrating the second embodiment of the reel device of the present invention;

[0020] Fig. 4a is a perspective view illustrating the second embodiment of the carrier device of the present invention;

[0021] Fig. 4b is a perspective view illustrating the third embodiment of the carrier device of the present invention;

[0022] Fig. 5 is a perspective view illustrating the fourth embodiment of the carrier device of the present invention;

[0023] Fig. 6 is a perspective view illustrating the fifth embodiment of the carrier device of the present invention;

[0024] Fig. 7 is a perspective view illustrating another embodiment of the reel device of the present invention;

[0025] Fig. 8a is an exploded view of the reel device illustrated in Fig. 7;

[0026] Fig. 8b is another exploded view of the reel device illustrated in Fig. 7;

[0027] Fig. 9 is a perspective view illustrating the latch device which limits the relative movement between the retractable wire and the spool;

[0028] Fig. 10a is a perspective view illustrating the sixth embodiment of the carrier device of the present invention;

[0029] Fig. 10b is another perspective view illustrating the sixth embodiment of the carrier device of the present invention;

[0030] Fig. 11 is a perspective view illustrating the seventh embodiment of the carrier device of the present invention;

[0031] Fig. 12 is a flow chart of the usage of the carrier device of the present invention; and

[0032] Fig. 13 is a perspective view illustrating the user using the carrier device of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0033] The present invention provides a carrier device using a reel device having a latch device, to easily manipulate the strap to stretch and to retract. In more preferred embodiments, the carrier device includes a handbag, a messenger bag, a briefcase, a carrying bag, a backpack or various small carrying bags, etc. The strap

includes a shoulder strap, a grip or a handle, etc. The following description will explain the present invention in detail with reference to the drawings.

[0034] As Fig 1 and Fig. 2 show, the carrier device 200 includes a carrier body 210, at least one strap 220 and a reel device 10. The strap 220 is movably disposed on one side of the carrier body 210. The reel device 10 is disposed on one side of the carrier body 210 and is preferably disposed at centre of the bottom of the carrier body 210. The above-mentioned one side of the carrier body 210 can be any one of the six lateral sides of the carrier body 210. The reel device 10 includes at least one spool 14, a first retractable wire 18a, a second retractable wire 18b and a latch device 16. One end of the first retractable wire 18a connects with the strap 220 while the other end is disposed in the spool 14. One end of the second retractable wire 18b connects with the strap 220 while the other end is coiled on the spool 14. The latch device 16 is disposed on the reel device 10 to releasably limit the relative movement between the retractable wire 18 and the spool 14.

[0035] In the embodiment illustrated in Fig. 1, the reel device 10 further includes a casing 12. The spool 14 includes a first spool 14a and a second spool 14b disposed respectively on the sides of the casing 12. The first spool 14a and the second spool 14b have respectively a spiral spring (not illustrated) provided for storing a resilience force to rotate the first spool 14a and the second spool 14b and to retract the first retractable wire 18a and the second retractable wire 18b. When the first retractable wire 18a and the second retractable wire 18b stretch, the spiral spring will gradually store resilience force formed by the torque due to the deformation in spiral spring. When the spiral spring releases its stored resilience force, the spiral spring will rotate the first spool 14a and the second spool 14b to retract the first retractable wire 18a and the second retractable wire 18b to be coiled on the first spool 14a and the second spool 14b.

[0036] Furthermore, the circumferential rim of the first spool 14a and that of the second spool 14b further includes respectively a plurality of teeth. The teeth are provided to be coupled with discs (not illustrated) on respectively two sides of the latch device 16 to limit or to release a relative movement between the first spool 14a and the first retractable wire 18a and a relative movement between the second spool 14b and the second retractable wire 18b. In other words, pressing the latch 16 means will release the limit on the relative movement between the first spool 14a and the first retractable wire 18a and the relative movement between the second spool 14b and the second retractable wire 18b. The first retractable wire 18a can stretch from or retract into the first spool 14a and the second retractable wire 18b can stretch from or retract into the second spool 14b. On the contrary, releasing the latch 16 means will limit the relative movement between the first spool 14a and the first retractable wire 18a and the relative movement between the second spool 14b and the second retractable wire 18b. The first

retractable wire 18a and the second retractable wire 18b are then refrained from retracting respectively into the first spool 18a and the second spool 18b.

[0037] In order to accommodate the spool 14 and the retractable wires 18, the thickness of the casing 12 preferably has a thickness of 0.5 inch, a width of 2.5 inches and a length of 6 inches. Thus the reel device 10 will be small and light enough to be disposed at the bottom, on the lateral sides or on top of a wallet, a handbag, a backpack or of other small carrying bags.

[0038] In the embodiment illustrated in Fig. 2, the carrier device 200 can include a wallet, a carrying bag, a messenger bag or other similar carrying bags. The carrier body 210 can include a non-rigid or a semi-rigid carrying bag having an opening structure. The opening structure can include a zip fastener, a buckle, a button, a Velcro, a sticker (adhesive) or other suitable elements. The carrier body 210 can be made of material consisting of natural fiber, artificial fiber, natural leather, artificial fiber or other suitable materials. The appearance of the carrier body 210 can include any unique or known design. The strap 220 can be made of material consisting of a natural fiber, artificial fiber, natural leather, artificial leather or other suitable non-rigid materials for the strap 220 to be attached comfortably on the shoulder of the user.

[0039] The reel device 10 is preferably disposed on the bottom center of the carrier body 210 and is attached to the carrier body 210 using screws, rivets, adhesive or other known methods or elements. The reel device 10 includes a latch 16 means, a first retractable wire 18a or a second retractable wire 18b. The first retractable wire 18a and the second retractable wire 18b can be made of materials consisting of a group of metal, plastic or other suitable materials and are preferably made of metal wire covered with nylon. The retractable wire 18 can include various diameters or various lengths, depending on the application of the reel device 10. In the present embodiment, the carrier device 200 further includes a guiding device 230 and a connecting device 240. The guiding device 240 is disposed on two sides of the reel device 10 and stretching to one end of each of the two sides of the carrier body 210. The guiding device 230 is provided to accommodate and to guide the retractable wire 18 between the reel device 10 and the strap 220. The guiding device 230 can include a pair of parallel and spaced guiding portions. The guiding portion can be made of a tube or other tube-shaped elements and can include durable and flexible materials such as metals and plastics. The guiding portions are preferably disposed respectively in two concavities on a surface of the carrier body 210. The guiding device 230 is provided for the first retractable wire 18a and the second retractable wire 18b to move within the concavities. However, in other different embodiments, the guiding device 230 can include a ridge protruding from a surface of the carrier body 210. The connecting device 240 can be disposed at two ends of each strap 220. The strap 220 preferably has a hole (not illustrated) for the first retractable wire 18a and the sec-

ond retractable wire 18b to movably pass. However, in different embodiments, the connecting device 240 can also include other suitable devices such as fixed connecting device, detachable connecting device or adjustable connecting device, etc.

[0040] One end of the first retractable wire 18a and one end of the second retractable wire 18b pass through one end of the connecting device 240 and are then wound around the first spool 14a and the second spool 14b. Another end of the first retractable wire 18a and another end of the second retractable wire 18b are fixed to a side opening (not illustrated) on the casing 12 by using a column, a bolt or other suitable elements. In one embodiment, the first/second retractable wire can also pass through one end of the strap 220, i.e. two ends of the strap 220 are folded and sewed to form an opening for the above-mentioned first/second retractable wire 18a, 18b to pass through. The first/second retractable wire 18a, 18b then passes through the guiding device 240 to be coiled the first spool 14a and the second spool 14b. Thus, the adjustment of the strap 220 (to stretch or to retract) involves pressing the latch device 16 to release the relative movement between the first spool 14a and the first retractable wire 18a and the relative movement between the second spool 14b and the second retractable wire 18b, in order for the strap 220 to stretch or to retract. It then means that the first retractable wire 18a and the second retractable wire 18b stretch or retract along one direction. On the contrary, when the force on the latch device 16 is released, the latch device 16 will limit the relative movement between the first spool 14a and the first retractable wire 18a and between the second spool 14b and the second retractable wire 18b, to restrict the retraction of the first retractable wire 18a and the second retractable wire 18b along one direction. It then means that the strap 220 is refrained from retracting back to the carrier body 210.

[0041] It needs to be emphasized that in the above-mentioned embodiments, the first retractable wire 18a and the second retractable wire 18b stretch from two shorter sides of the reel device 10 to two top sides of the carrier body 210. The above-mentioned top sides are the two opposite sides of the carrier body 210 having smaller area. However, in the embodiment illustrated in Fig.3, Fig. 4a and Fig. 4b, the first retractable wire and the second retractable wire stretch from two longer sides of the reel device 10 to the top sides of the carrier body 310. The above-mentioned top sides are the two opposite sides of the carrier body 310 having greater area. In other words, the first retractable wire 18a and the second retractable wire 18b stretch respectively from two opposite sides of the carrier body 310 having greater area to connect with two ends of the strap 220. Thus the carrier device 300 includes handbags, briefcases, etc. The carrier body 310 can include a non-rigid or a semi-rigid carrying bag having an opening structure. The means for closing the opening structure can include a zip fastener, a buckle, a button, a Velcro or other suitable means for closing the

opening structure. The carrier body 310 and the strap 320 can be made of material consisting of natural fiber, artificial fiber, natural leather, artificial fiber or other suitable materials to be comfortably carried or held by hand.

[0042] In the embodiment illustrated in Fig. 3 and Fig. 4a, the reel device 10 can be disposed on the centre of the bottom of the carrier body 310 and the reel device 10 can be attached on the carrier body 310 using screws, rivets, adhesives or other know methods or elements. The reel device 10 has a latch device 16, a first spool 14a and a second spool 14b. The first spool 14a has a first retractable wire 18a and a second retractable wire 18b and the second spool 14b also has a first retractable wire 18a and a second retractable wire 18b. In other words, each spool has two retractable wires to be simultaneously stretching or retracting from the spool. The circumferential rim of the first spool 14a and that of the second spool 14b have a plurality of teeth. The teeth are provided for coupling with a disc on respectively two sides of the latch device 16 to limit or to lease a relative movement between the first spool 14a and the first retractable wire 18a and a relative movement between the second spool 14b and the second retractable wire 18b. The guiding device 330 can stretch from the two longer sides of the reel device 10, over the two opposite sides of the carrier body 310 having greater area, to the top sides of the carrier body 310. The guiding device 330 is disposed in the concavity on the surface of the carrier body 310. The guiding device 330 can be made of a tube or other tube-shaped elements and can include durable and flexible materials such as metals and plastics. The connecting device 340 can be part of the strap 320. One end of the strap 320 can be bent and sewed and can then preferably fitted with a plastic covering having a hole; the hole is provided for the first/second retractable wire 18a, 18b to movably pass through. However, in the embodiment illustrated in Fig. 4b, each end of the strap 320 can be fitted with a connecting device 340 to be connected respectively with strap and the first/second retractable wire 18a, 18b. The pulley 350 is preferably disposed within the connecting device 340 and will rotate relatively to the connecting device 340.

[0043] In the embodiment illustrated in Fig. 4a, one end of the first retractable wires 18a and one end of the second retractable wires 18b can stretch from the longer sides of the reel device 10, move along the guiding device 330 and then fixed on one end of the strap 320. Another ends of the first retractable wire 18a and the second retractable wire 18b are disposed in the first spool 14a and the second spool 14b. However, in the embodiment illustrated in Fig. 4b, one end of the first retractable wire 18a and one end of the second retractable wire 18b can stretch from the longer sides of the reel device 10, move through the guiding device 330 and the pulley 350 of the connecting device 330; then pass through the guiding device 330 again and are fixed on the bottom or any other location of the carrier body 310. Thus the first/second retractable wire 18a, 18b can generate relative move-

ment with respect to the pulley 350 of the connecting device 340 in order to improve the sensitivity as well as the usability of stretching and retracting the first/second retractable wire 18a, 18b.

[0044] When the user applies a force on the strap 320 to pull the strap 320 upward and simultaneously presses the latch device 16, the latch device 16 will release the limit on the relative movement between the first spool 14a and the first retractable wire 18a and that between the second spool 14b and the second retractable wire 18b. The user can then simultaneously stretch or retract the first/second retractable wire 18a, 18b in order for the strap 320 to stretch or to retract with respect to the carrier body. When the latch device 16 is released, the latch device 16 will then limit the relative movement between the first spool 14a and the first retractable wire 18a and the relative movement between the second spool 14b and the second retractable wire 18b. Thus the strap 320 cannot stretch or retract with respect to the carrier body 310.

[0045] It needs to be explained here that the length of the strap 320 stretching from the carrier body 310 is equal to the stretching length of the first retractable wire 18a and also the stretching length of the second retractable wire 18b. Furthermore, in the embodiment illustrated in Fig. 4b, when the strap 320 stretches, the first/second retractable wire 18a, 18b will stretch in the same direction as the strap 320 (such as away from the first/second spool 14a, 14b). On the contrary, when the strap 320 retracts, the first/second retractable wire 18a, 18b will retract in the same direction as the strap 320 (such as toward the first/second spool 14a, 14b).

[0046] As Fig. 5 shows, the carrier device 400 can also include a carrier body 410 having a single shoulder strap/strap 420 such as a backpack or a carrying bag. However, in the embodiment illustrated in Fig. 6, the carrier device 500 can also include a carrier body 510 having two shoulder straps/straps 520. The carrier body 510 illustrated in Fig. 5 and in Fig. 6 can include a non-rigid or semi-rigid bag in the prior art having an opening structure. The carrier body 410, 510 and the strap 420, 520 can be made of material consisting of natural fiber, artificial fiber, natural leather, artificial fiber or other suitable materials. The appearance of the carrier body 510, 510 can include any unique or known designs to be comfortably attached to one or two shoulders of the user.

[0047] In the embodiment illustrated in Fig. 5, the strap 420 has two ends and one end is fixably connected to one end of the carrier body 410 while the other end is movably connected to another end of the carrier body 410. The reel device 10 is disposed on the centre of the bottom of the carrier body 410. The reel device 10 is fixed on the carrier body 410 by using screws, rivets, adhesives or other known methods or elements. The reel device 10 includes a spool 14, a retractable wire 18 and a latch device 16. The latch device 16 has a disc (not illustrated) to be coupled with the teeth on the circumferential rim (not illustrated) of the spool 14. Thus the latch device 16

can limit the relative movement between the spool 14 and the retractable wire 18 by moving on one side of the reel device 10. However, in other different embodiments, the connecting device 440 can be formed through bending and sewing the strap 420 or through other suitable methods in order for the retractable wire 18 to pass through.

[0048] In the present embodiment, the reel device 10 preferably has a spool 14 and a retractable wire 18 for corresponding use with one end of the strap 420. However, in the embodiment illustrated in Fig. 6, the reel device 10 can have a plurality of spools 14a, 14b and retractable wires 18a, 18b for corresponding use with one end of each of the two straps 420 or with two ends of one strap 420. One end of the retractable wire moves over the guiding device, passes through one end of the connecting device 440 (or one end of the strap), then again passes through the guiding device 430 to be coiled in the spool 14. Another end of the retractable wire 18 is fixed on the casing 12. The above-mentioned connecting device 440 has a hole (not illustrated) for the retractable wire 18 to movably pass through. When the user applies a force on the strap 420 and simultaneously presses the latch device 16, the latch device 16 will allow the spool 14 to rotate within the reel device 10 for the strap 420 to be pulled or to retract. When the force on the latch device 16 is withdrawn, the latch device 16 will limit the relative movement between the spool 14 and the retractable wire 18. It also means that the latch device 16 restrains the spool 14 from rotating in the reel device 10 and thus the strap 420 is refrained from being pulled or retracted.

[0049] In the embodiment illustrated, the carrier device 500 includes a backpack or other carrying bags having two shoulder straps/straps 520. One end of each of the strap 520 is fixably connected to the top side of the carrier body 510 while another end of each of the strap 520 is movably connected to the bottom of the carrier body 510. The guiding device 530 is disposed on two sides of the reel device 10 and stretches from two opposite sides of the bottom of carrier body 510 to one end of the strap 520. As Fig. 6 shows, one end of the strap 520 can also be part of the carrier body 510, i.e. an extension strap stretching from the carrier body 510 or a portion of the carrier body 510 is connected the strap 520. The connecting device 540 can be disposed on the extension strap or on one end of the strap 520. However, in other embodiments, the connecting device 540 can be formed by bending and sewing one end of the strap 520.

[0050] In the present embodiment, the reel device 10 has a latch device 16, a first spool 14a and a second spool 14b. The first spool 14a and the second spool 14b have respectively a first retractable wire 18a and a second retractable wire 18b stretching from two short sides of the reel device 10. Thus one end of the first/second retractable wire 18a, 18b stretches from one shorter side of the reel device 10, passes through one end of the connecting device 540 along the guiding device 530 and is then wound around the first/second spool 14a, 14b

while the other end is fixed on the casing 12. When the user applies a force on the strap 520 and simultaneously presses the latch device 16, the latch device 16 will release the limit on the relative movement between the first retractable wire 18a and the first spool 14a and between the second retract wire 18b and the second spool 14b, for the strap 520 to stretch or to retract. When the latch device 16 is released, the latch device 16 will then limit the relative movement between the first retractable wire 18a and the first spool 14a and between the second retractable wire 18b and the second spool 14b and thus the strap 520 are refrained from being stretched or retracted.

[0051] Fig. 7 is the perspective view while Fig. 8a and Fig. 8b are the exploded view of the reel device of the present invention. The reel device 20 of the present invention includes a latch device 70, at least one retractable wire 50 and a casing 22. The casing 22 is provided for accommodating the spool 30, retractable wire 50 and other elements. The spool 30 further includes a plurality of first teeth 32 and at least one groove 36, wherein the groove 36 is formed on the circumferential side of the spool 30 for the retractable wire 50 to be wound around. In the embodiment illustrated in Fig. 8a and in Fig. 8b, the retractable wire further includes a first retractable wire 50 and a second retractable wire 60. The spool 30 includes a first groove 50 and a second groove 60 for respectively one end of the first retractable wire 50 and one end of the second retractable wire 60 to be movably wound around. Another end of the first/second retractable wire 50, 60 is then fixed on opening (not illustrated) of the casing 22 in a form of a column or using other methods. The first/second retractable wire 50, 60 are wound around one axis in the same direction, but the two wires can be attached to the spool 30 in two opposite locations. Thus when the spool 30 rotate in one direction, the first retractable wire 50 and the second retractable wire 60 can simultaneously stretch or retract.

[0052] Furthermore, the first groove 36 and the second groove 38 preferably have the same axis and are preferably adjacent to each other. The spool 30 further includes a spiral spring 34 or other springs which can generate torque through deformation. The latch device 70 has a plurality of second teeth 82 corresponding to the first teeth 32. The first teeth 32 are distributed around the inner rim on one side of the spool 30 and the spiral spring 34 is disposed in a space opposite to the side of the spool 30 having the first teeth 32. When the first retractable wire 50 and the second retractable wire 60 stretch from the carrier body, the spiral spring 34 will be twisted correspondingly to store a resilience force which is later used to retract the first retractable wire 50 and the second retractable wire 60.

[0053] In the embodiment illustrated in Fig. 8a and Fig. 8b, the casing 22 further has a column 28, a first casing 22a, a second casing 22b, an opening 29 and a guiding slot 27. The opening 29 and the guiding slot 27 are disposed on either the first casing 22a or the second casing

22b. The guiding slot 27 is disposed on two sides of the opening 29 and the latch device 70 has a pair of fins 72 disposed respectively on the two lateral sides of the latch device 70. Each fin 72 is disposed in the guiding slot 27 for the latch device to be movably positioned on the opening 29. Thus the latch device 70 can selectively move on the first casing 22a of the reel device 10. The first casing 22a has at least one assembly column 24 and the second casing 22b has at least one assembly hole 26 for accommodating the assembly column 24. A screw (not illustrated) is preferred to be used to pass through the assembly hole 26 from the outside and fixes the assembly column 24 on the second casing 22b. Thus the reel device 10 can be fixed on one side of the carrier device (not illustrated). However, in other embodiments, the second casing 22b can also include a stopper to be coupled with the assembly column 24.

[0054] The latch device 70 further includes a stopper block 80, at least one helix spring 84 and a hook portion 74. One end of the helix spring 84 contacts with the casing 22 (the first casing 22a) while another end contacts with the stopper block 80 for returning the latch device 70 to its initial position. As Fig. 9 also shows, pressing the latch 70 will decouple the second teeth 82 of the stopper block 80 with the first teeth 32 of the spool 30. At the same time, the helix spring 84 will be compressed and thus an elastic energy is stored. In other words, the latch device 70 releases the limit on the relative movement between the spool 30 and the retractable wire 50, 60. Thus the first retractable wire 50 and the second retractable wire 60 can stretch respectively from the first groove 36 and the second groove 38 or can be coiled in the first groove 36 and the second groove 38.

[0055] On the contrary, when force on the latch device 70 is released, the helix spring 84 will simultaneously releases the stored elastic energy and pushes the latch device 70 to the position before the force is applied on the latch device 70. At the same time, the second teeth 82 couple with the first teeth 32 on the spool 30 and thus the latch device 70 refrains the spool 30 from rotating. It also means that the latch device 70 limit the relative movement between the spool 30 and the first/second retractable wire 20, 60. In other words, when the force on the latch device 70 is released, the helix spring 84 of the stopper block 80 will release its elastic energy which moves the latch device 70 along the guiding slots 27 of the first casing 22a to the position before the force is applied on the latch device 70. Furthermore, the hook portions 74 of the latch device 70 have respectively a protrusion 76. The stopper block 80 includes a stopper opening 86 and stopper skirts 88 disposed on two sides of the stopper opening 86. The stopper opening 86 is provided for accommodating the hook portion 74 and for the protrusion 76 to be positioned on the stopper skirt 88. Thus the stopper block 80 can be coupled with the latch device 70. However, in different embodiments, the latch device 70 and the stopper block 80 can be formed in an integral entity.

[0056] Fig. 10a and Fig. 10b are the perspective views of the carrier device using the reel device mentioned above. The carrier device 600 of the present invention (such as a backpack or a messenger bag) includes a carrier body 610, at least one strap 620 having two ends and a reel device 20. Each of the two ends of the strap 620 can be movably connected to one side of the carrier body 610. The carrier body 610 can include a non-rigid carrying bag having an opening structure and the opening structure can include a zip fastener, a buckle, a button, a Velcro or other suitable elements. The materials of the storage structure and the strap 620 can include natural fiber, artificial fiber, natural leather, artificial fiber or other suitable materials. The appearance of the carrier body 610 and that of the strap 620 can include any unique or known design for them to be comfortably attached on the shoulder of the user.

[0057] The reel device 20 includes a latch device 70, a first retractable wire 50 and a second retractable wire 60. The reel device is preferably disposed at the centre of the bottom of the carrier body 610. The first retractable wire 50 of the reel device 20 is connected to one end of the strap 620 and the second retractable wire 60 is connected to another end of the strap 620. Thus the first retractable wire 50 and the second retractable wire 60 move together with the strap 620. The materials of the first/second retractable wire 50, 60 can include any known material but preferably includes a metallic cable having a nylon covering. The latch device 70 couples with a plurality of first teeth (not illustrated) by using a plurality of second teeth (not illustrated) in order to limit or to release the relative movement between the spool and the first/second retractable wire 50, 60 (as described above and in Fig. 9). The guiding device 630 is disposed on two sides of the reel device 20 and stretches to two top sides of the carrier body 610. The guiding device 630 is used to guide the first/second retractable wire 50, 60. In the present embodiment, the guiding device 630 includes a pair of parallel and spaced concavities for guiding the first/second retractable wire 50, 60 to move smoothly and without being interfered. The concavity can be made of a tube or other tube-shaped elements and can include durable and flexible materials such as metals and plastics. However, in other embodiments, the guiding device 630 can include a ridge protruding from the surface of the carrier body 610.

[0058] The connecting device 640 can be disposed at two ends of the strap 620 and its interior is disposed with a pulley 650 for the first/second retractable wire 50, 60 to be movably wound around in order to improve the sensitivity as well as the usability of stretching and retracting the first/second retractable wire 50, 60. However, in other different embodiments, one end of the connecting device 640 can have a hole for the first/second retractable wire 50, 60 to movably pass through. The connecting device 640 can be formed by bending and sewing one end of the strap for the first retractable wire 50 and the second retractable wire 60 to be connected with the strap 620.

[0059] In the embodiment illustrated in Fig. 10a, when the user applies a force to pull the strap 620 away from the carrier body 610 and simultaneously presses the latch device 70. The latch device 70 will release the limit on the relative movement between the first/second retractable wire 50, 60 and the spool (not illustrated). The first retractable wire 50 and the second retractable wire 60 can then be pulled or retracted and thus the strap 620 can be pulled or retracted. Furthermore, when the strap 620 is pulled, the first retractable wire 50 and the second retractable wire 60 can be stretched in the same direction as the strap 620 (such as away from the spool). On the contrary, when the strap 620 retracts, the first retractable wire 50 and the second retractable wire 60 will also retract in the same direction as the strap 620 (such as towards the spool). In the embodiment illustrated in Fig. 10b, when the force applied on the latch device 70 is released, the latch device 70 will limit the relative movement between the spool (not illustrated) and the first/second retractable wire 50, 60 and thus the latch device 70 refrains the spool (not illustrated) from rotating within the reel device 20. The first retractable wire 50, the second retractable wire 60 and the strap 620 thus cannot retract or stretch.

[0060] As Fig. 11 shows, the carrier device 700 can include a carrier body 710 (such as a wallet, a handbag or carrying bag, etc.) having a single strap 720. However, in other embodiments, the carrier device 700 can also be used in the carrier body 710 having two shoulder straps 720. The carrier body 710 can include a rigid or a non-rigid carrying bag in the prior art having an opening structure. The material of the carrier body 710 and that of the strap 720 can consist of natural fiber, artificial fiber, natural leather, artificial fiber or other suitable materials. The appearance of the carrier body 710 can include any unique or known design to be comfortably attached on the shoulder or held by hand.

[0061] In the present embodiment, the reel device 20 is disposed at the centre of the bottom of the carrier body 710. The reel device 20 is also fixed on the carrier body 710 using screws, rivets, adhesives or other known methods or elements. The reel device 20 preferably includes a retractable wire 50 and a latch device 70 to be used with one end of the strap 720. In other words, one end of the strap 720 is fixably connected with one end of the carrier body 710 while another end of the strap 720 is movably connected to another end of the carrier body 710. The strap 720 operates together with the retractable wire 50 to adjust the length of the strap 720 stretching from the carrier body 710. The latch device 70 couples with a plurality of first teeth of the spool using a plurality of second teeth in order to limit or to release the relative movement between the spool and the retractable wire 50 (please refer to the embodiments described above and Fig. 9). The guiding device 730 is disposed on one side of the reel device 20 and extends from one shorter side of the reel device 20 to one top side of the carrier body 710. The connecting device 740 is connected respectively to the strap 720 and to the retractable wire 50.

A pulley 750 is disposed within the connecting device 740 for improving the sensitivity as well as the usability of stretching and retracting the strap 720. However, in other embodiments, the connecting device 740 can be made by disposing a pulley 750 at one end of the strap 720 or other suitable sliding elements.

[0062] In the embodiment illustrated in Fig. 11, one end of the retractable wire 50 passes through the guiding device 730 and is then wound around the pulley 750 of the connecting device 740, afterwards the retractable wire 50 passes through the guiding device 730 again and is then disposed in the spool (not illustrated) of the reel device 20. Another end of the retractable wire 50 is fixed on a hole of the casing 22. When the user applies a force on the strap 720 and simultaneously presses the latch device 70, the latch device 70 will release the limit on the relative movement between the spool (not illustrated) and the retractable wire 50 to stretch or to retract the retractable wire 50. In other words, the strap 720 can be stretched or retracted. When the force on the latch device 70 is released, the latch device 70 will then limit the relative movement between the spool (not illustrated) and the retractable wire 50. It means that the latch device 70 refrains the spool (not illustrated) from rotating in the reel device 20 and thus the retractable wire 50 or the strap 720 cannot be stretched or retracted.

[0063] The following will further explain the usage of the retractable wire of the carrier device of the present invention. The carrier device further includes a carrier body, a strap movably disposed on side of the carrier body and a reel device. The reel device is disposed on the bottom of the carrier body. The reel device has a spool, at least one retractable and a latch device. The retractable wire is wound around the spool. The latch device is disposed on the reel device and can selectively limit the relative movement. For information concerning elements mentioned in the following section, please refer to the embodiments explained in the foregoing paragraphs.

[0064] Fig. 12 is the flow chart illustrating the usage of the carrier device of the present invention having an adjustable strap. Steps of the usage of the carrier device having retractable wire includes:

[0065] Step 800 includes pressing the latch device in order to limit the limit on the relative movement between the spool in the reel device and the retractable wire. Step 810 includes adjusting the length the strap stretching from the carrier body. Step 820 includes releasing the latch device to limit the relative movement between the spool within the reel device and the retractable wire in order to refrain the strap from stretching or retracting relative to the carrier body which facilitates the usage by the user.

[0066] In the present embodiment, step 810 further includes adjusting the strap to retract and to connect with the carrier device. Furthermore, step 810 includes applying a force on the strap and simultaneously pressing the latch device to adjust the length that the strap stretching

from the carrier device. On the other hand, the action of pressing the latch device together with the control of force applied on the strap can adjust the length that the strap stretching or retracting relative to the carrier body to be suitable for the user.

[0067] Furthermore, when the strap stretches from the carrier device, two ends of the strap will simultaneously stretch from the carrier device. When the strap retracts back to the carrier device, two ends of the strap will simultaneously retract back to the carrier device. Thus the length that the strap stretching from the carrier device can be adjusted for the strap to be attached to user's shoulder or to be carried by hand. However, in other embodiments, two ends of the strap can stretch or retract in different length relative to the carrier device or at different time.

[0068] Fig. 13 is a perspective view illustrating the user using the carrier device 800 of the present invention. When the user carries the carrier device 800 on the shoulder of the same side of the carrier device 800 or on another shoulder on the opposite side of the carrier device 800 (illustrated in dotted line), one hand of the user will pass through the opening between the strap 820 and the carrier device 800 to quickly and easily presses the latch device 70 of the reel device 200 to release the limit on the relative movement between the retractable wire 50 and the spool (not illustrated). Thus the strap 820 will be simultaneously stretched or retracted to a length and a position suitable for the user's body. When the user releases the latch device 70 to limit the relative movement between the retractable wire 50 and the spool (not illustrated), the strap 820 will be refrained from stretching or retracting.

[0069] The above is a detailed description of the particular embodiment of the invention which is not intended to limit the invention to the embodiment described. It is recognized that modifications within the scope of the invention will occur to a person skilled in the art. Such modifications and equivalents of the invention are intended for inclusion within the scope of this invention.

Claims

1. A carrier device having an adjustable strap, comprising:

a carrier body;
at least one strap movably disposed on one side of the carrier body; and
a reel device disposed on one side of the carrier body, the reel device having at least one spool, at least one retractable wire and a latch device, the retractable wire being connected to one end of the strap and being coiled on the spool, wherein the latch device is disposed on the reel device and releasably limit a relative movement between the retractable wire and the spool.

2. The carrier device of claim 1 further comprising a guiding device disposed on at least one side of the reel device and stretching to at least one side of the carrier body, the guiding device guiding the retractable wire between the reel device and the strap. 5
3. The carrier device of claim 1, wherein the reel device further includes a casing, the spool includes a first spool and a second spool disposed at two sides of the carrier body, wherein the first spool and the second spool respectively has a spiral spring for storing a resilience force to rotate the first spool and the second spool and to retract the retractable wire. 10
4. The carrier device of claim 3, wherein the retractable wire further includes a first retractable wire and a second retractable wire, one end of the first retractable wire movably passes through one end of the strap while the other end is fixed on the casing, one end of the second retractable wire movably passes through one end of the strap while the other end is fixed on the casing, the first retractable wire is coiled on the first spool and the second retractable wire is coiled on the second spool. 15 20 25
5. The carrier device of claim 1, wherein the reel device further has a casing, the spool further includes a plurality of first teeth and at least one groove, wherein the groove is formed on a circumferential side of the spool. 30
6. The carrier device of claim 5, wherein one end of the retractable wire movably passes one end of the strap to coil in the groove while another end is fixed on the casing, the retractable wire is disposed in the groove. 35
7. The carrier device of claim 6, wherein one end of the strap further includes a pulley for the retractable wire to be disposed on the pulley. 40
8. The carrier device of claim 5, wherein the spool further includes a spiral spring, the latch device has a plurality of second teeth corresponding to part of the first teeth, wherein the first teeth are distributed on an inner rim on one side of the spool, the spiral spring is disposed in a space opposite to the side of the spool having the first teeth. 45
9. The carrier device of claim 5, wherein the casing further includes an opening and at least one guiding slot adjacent to at least one side of the opening, the latch device has at least one fin disposed on at least one lateral side of the latch device, the fin of the latch device is disposed in the guiding slot for the latch device to be movably positioned the latch device on the opening. 50 55
10. A carrier device having an adjustable strap comprising:
 - a carrier body;
 - at least one strap having two ends, the two ends of the strap are movably connected to one side of the carrier body; and
 - a reel device disposed at a bottom of the carrier body, the reel device having at least one spool, a first retractable wire, a second retractable wire and a latch device, the first retractable wire being connected to one of the two ends of the strap and the second retractable wire being connected to another one of the two ends of the strap, wherein the first retractable wire and the second retractable wire are coiled on the spool, the latch device is disposed on the reel device and releasably limit a relative movement between the first retractable wire and the spool and a relative movement between the second retractable wire and the spool.
11. The carrier device of claim 10 further comprising a guiding device disposed on at least one side of the reel device and stretching to at least one side of the two sides of the carrier body, the guiding device guiding a length of the first retractable wire and a length of the second retractable wire between the reel device and the strap.
12. The carrier device of claim 10, wherein the reel device further has a casing, the spool further includes a plurality of first teeth and at least one groove, wherein the groove is formed on a circumferential side of the spool.
13. The carrier device of claim 12, wherein one end of the first retractable wire movably passes one end of the strap to coil in the groove while another end is fixed on the casing, one end of the second retractable wire movably passes one end of the strap to coil in the groove while another end is fixed on the casing, the first retractable wire and the second retractable wire is disposed in the grooves around the spool.
14. The carrier device of claim 13, wherein one end of the strap further includes a pulley for the retractable wire to be disposed on the pulley.
15. The carrier device of claim 12, wherein the spool further includes a first groove and a second groove, one end of the first retractable wire is coiled in the first groove while another end is fixed on the casing, one end of the second retractable wire is coiled in the second groove while another end is fixed on the casing.
16. The carrier device of claim 15, wherein the spool further includes a spiral spring, the latch device has

a plurality of second teeth corresponding to part of the first teeth, wherein part of the first teeth are distributed on an inner rim on one side of the spool, the spiral spring is disposed in a space opposite to the side of the spool having the inner rim.

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17. The carrier device of claim 12, wherein the casing further includes an opening and at least one guiding slot adjacent to at least one side of the opening, the latch device has at least one fin disposed on at least one lateral side of the latch device, the fin is disposed in the guiding slot to movably position the latch device on the opening. 10
18. An usage of the carrier device having an adjustable strap, wherein the carrier device further includes a carrier body, a strap movably disposed on one side of the carrier body and a reel device disposed on one side of the carrier body, the reel device has one spool, at least one retractable wire and a latch device, wherein the retractable wire is coiled on the spool, the latch device is disposed on the reel device and releasably limit a relative movement between the retractable wire and the spool, the usage includes: 15 20 25
pressing the latch device to release a limit on a relative movement between the retractable wire and the spool;
adjusting a length between the strap and the carrier device; and 30
releasing the latch device to limit the relative movement between the retractable wire and the spool. 35
19. The usage of claim 18, wherein the step of adjusting the length between the strap and the carrier device includes adjusting the strap to retract and to connect with the carrier device. 40
20. The usage of claim 18, wherein the step of adjusting the length between the strap and the carrier device includes applying a force on the strap and pressing the latch device to increase the length of the strap stretching from the carrier device. 45
21. The usage of claim 18, wherein the step of adjusting the length between the strap and the carrier device includes pressing the latch device and releasing a force applied on the strap for the strap to retract and to connect with the carrier device. 50
22. The usage of claim 18, wherein when the strap stretches from the carrier device, two ends of the strap simultaneously stretch from the carrier device. 55
23. The usage of claim 18, wherein when the step retract back to the carrier device, both ends of the strap

simultaneously retract back to the carrier and connects with the carrier device.

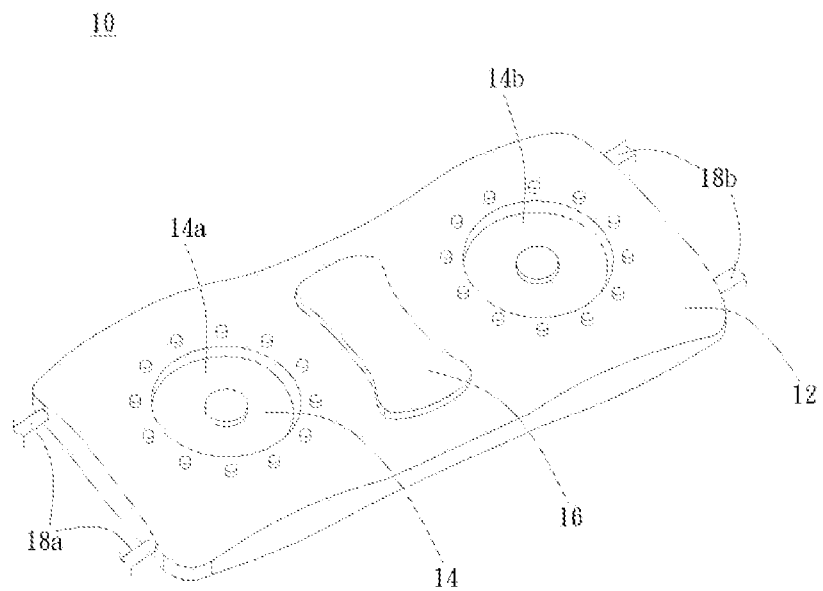


Fig. 1

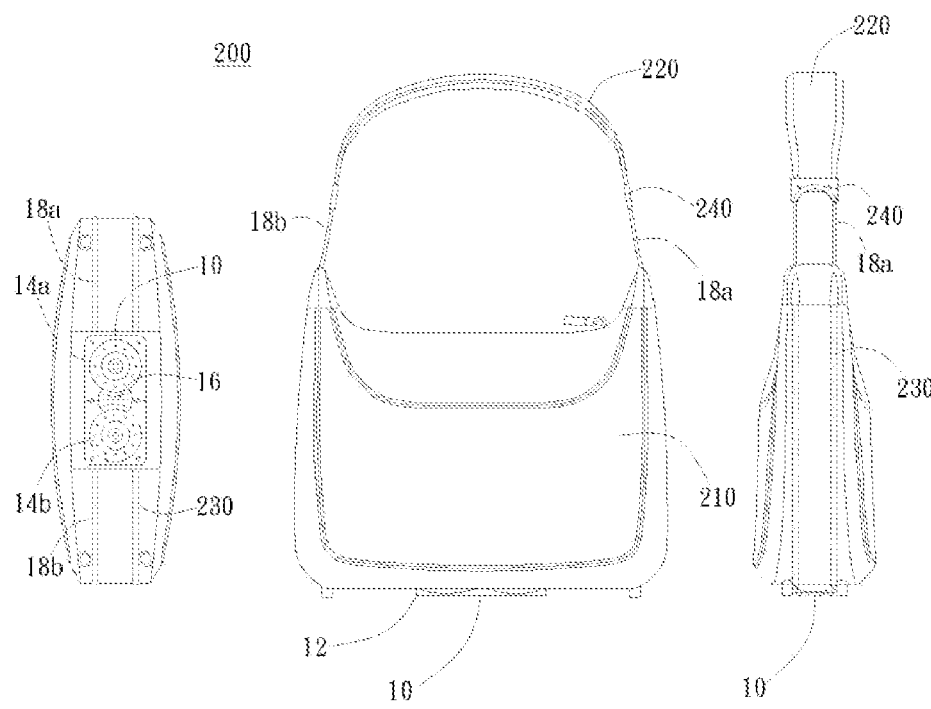


Fig. 2

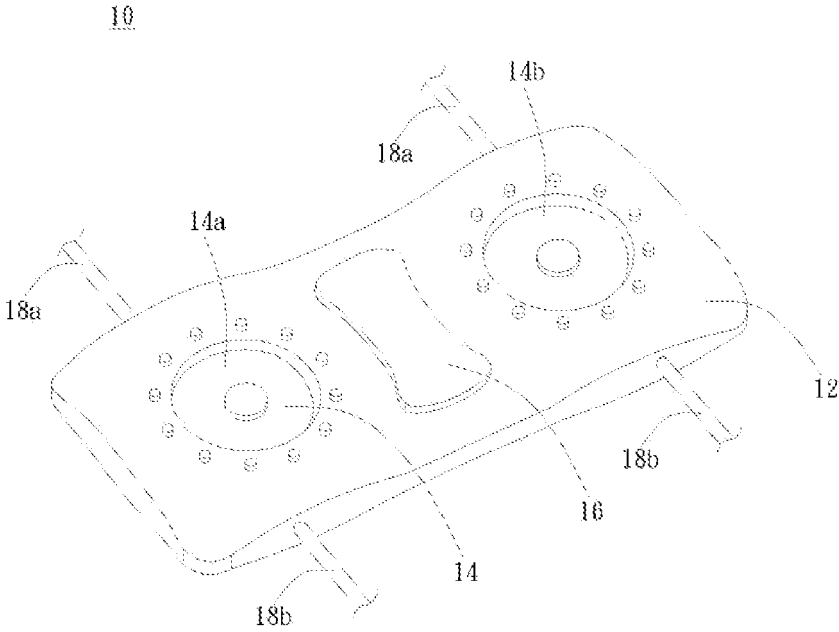


Fig. 3

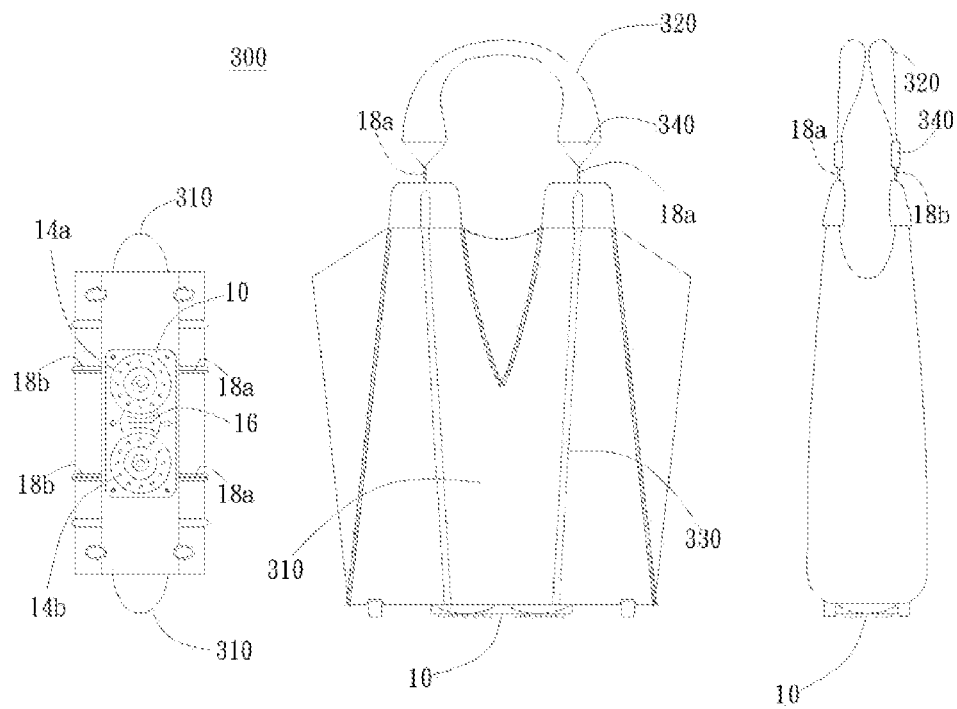


Fig. 4a

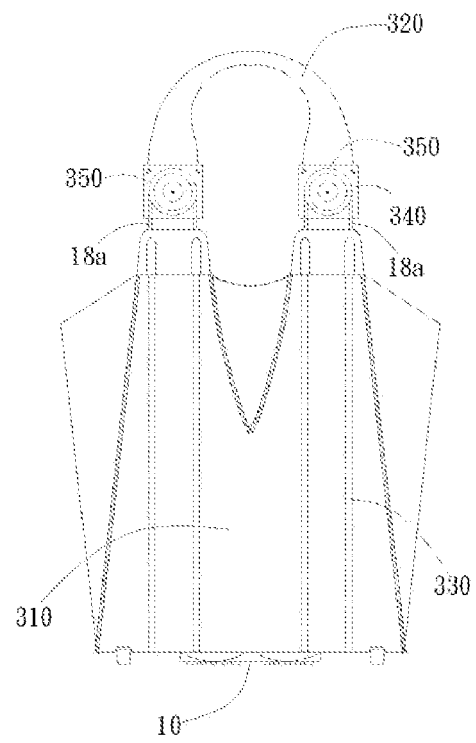


Fig. 4b

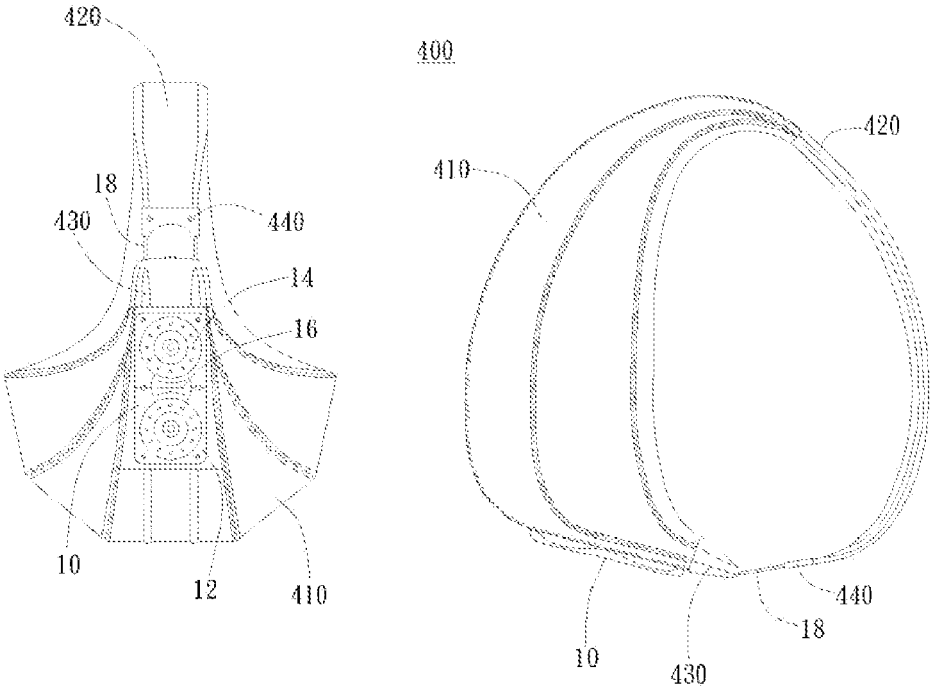


Fig. 5

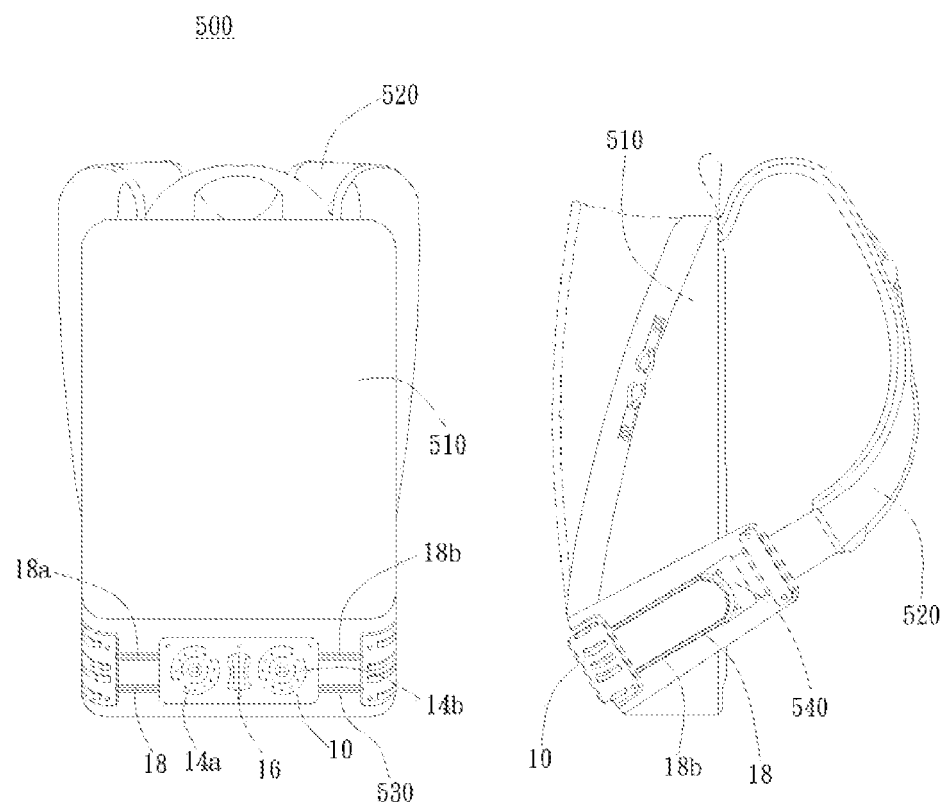


Fig. 6

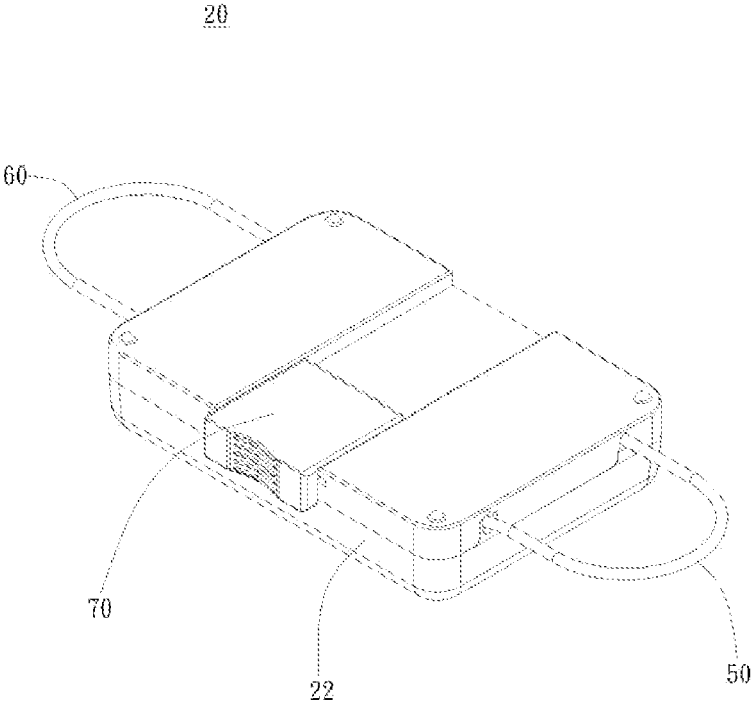


Fig. 7

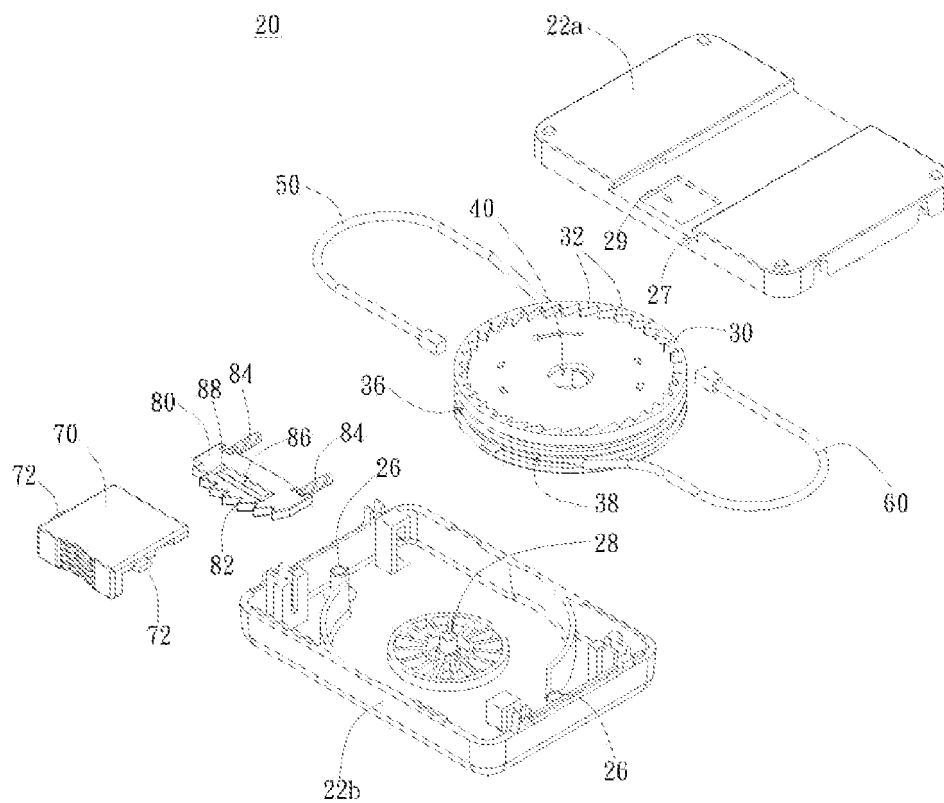


Fig. 8a

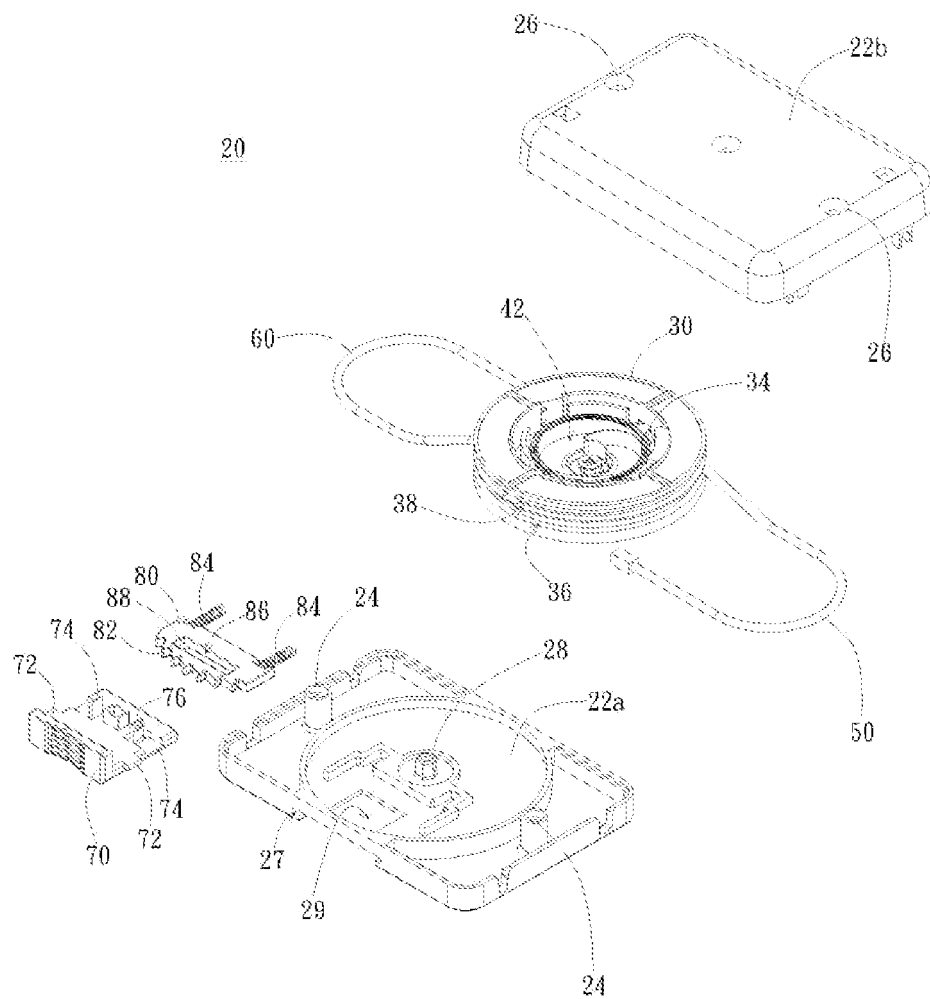


Fig. 8b

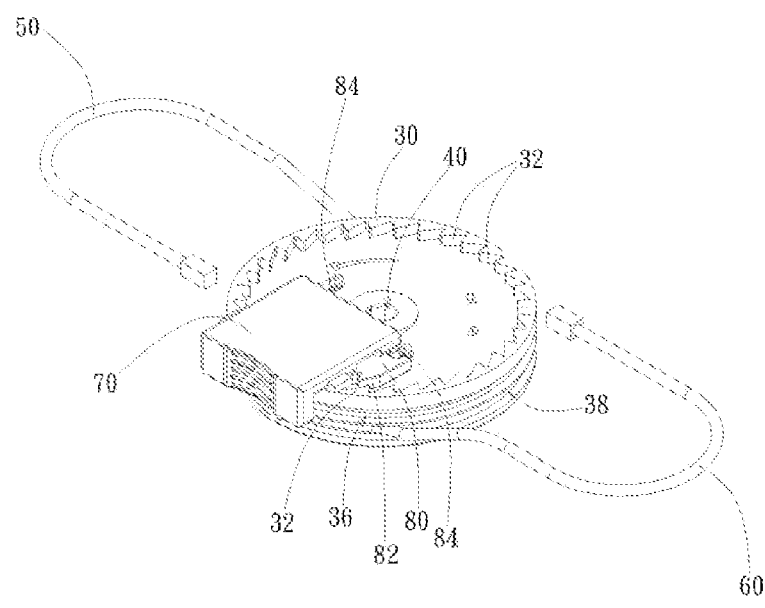


Fig. 9

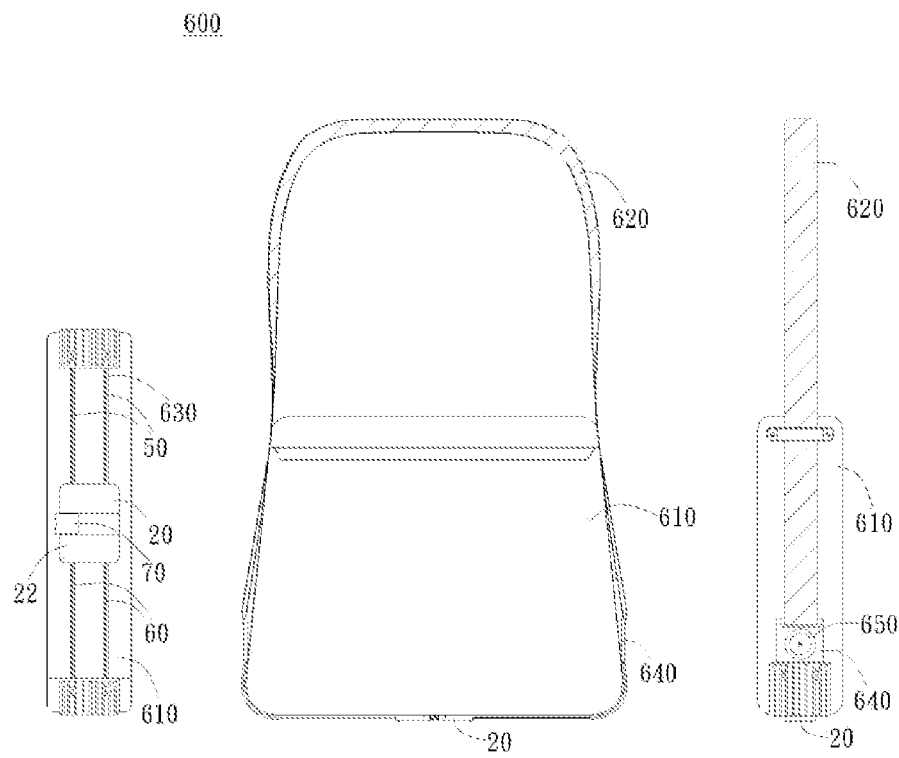


Fig. 10a

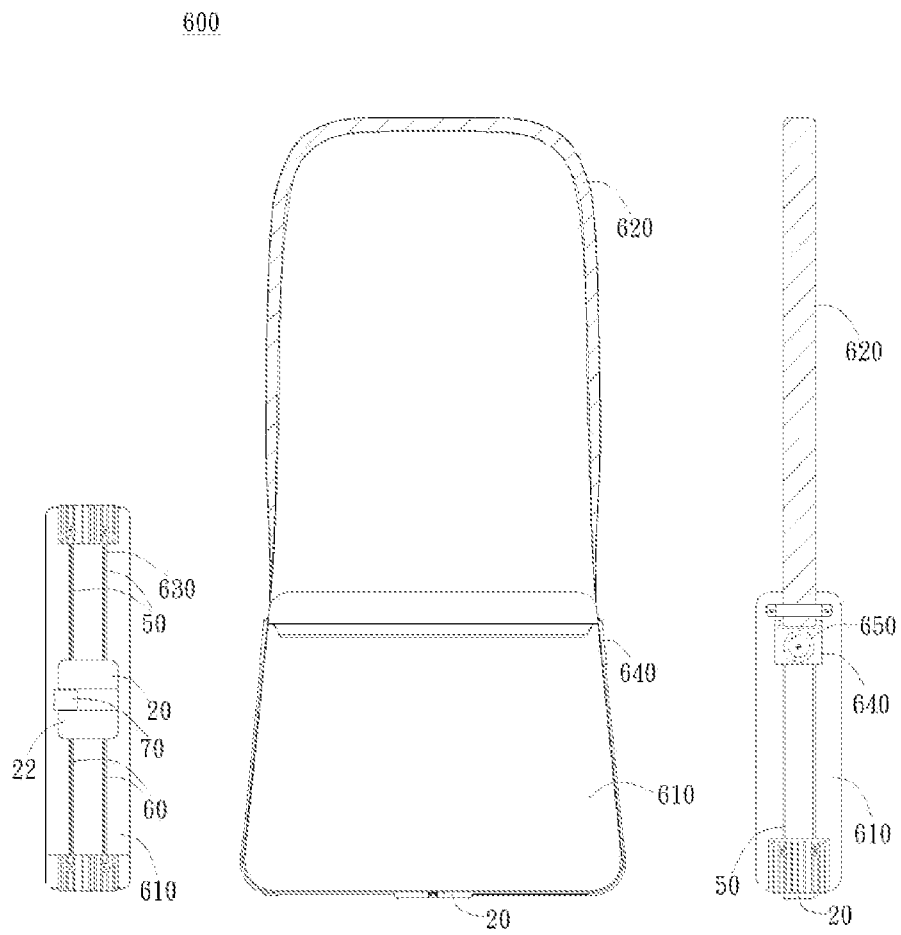


Fig. 10b

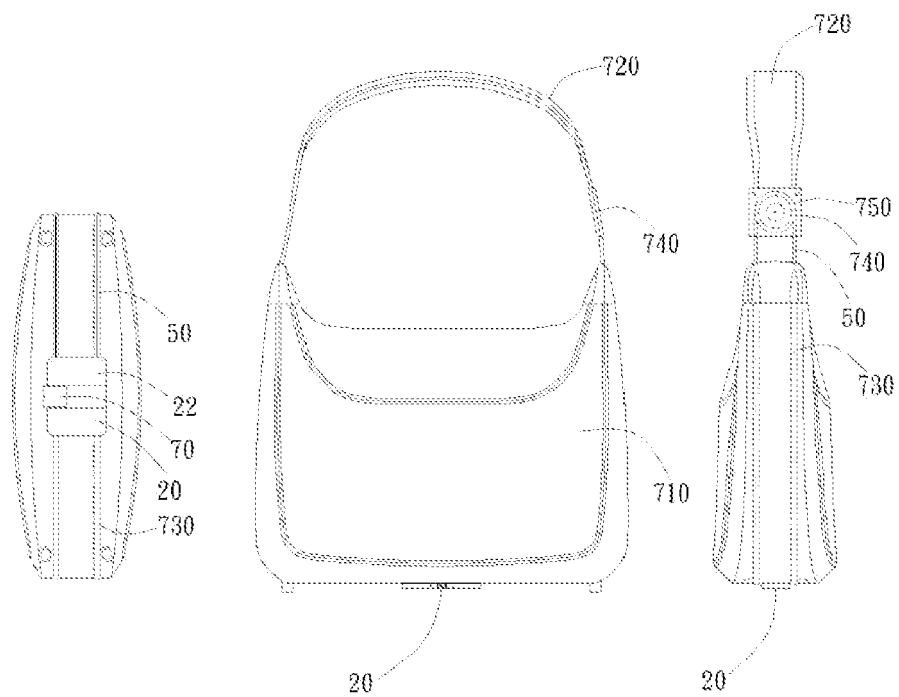


Fig. 11

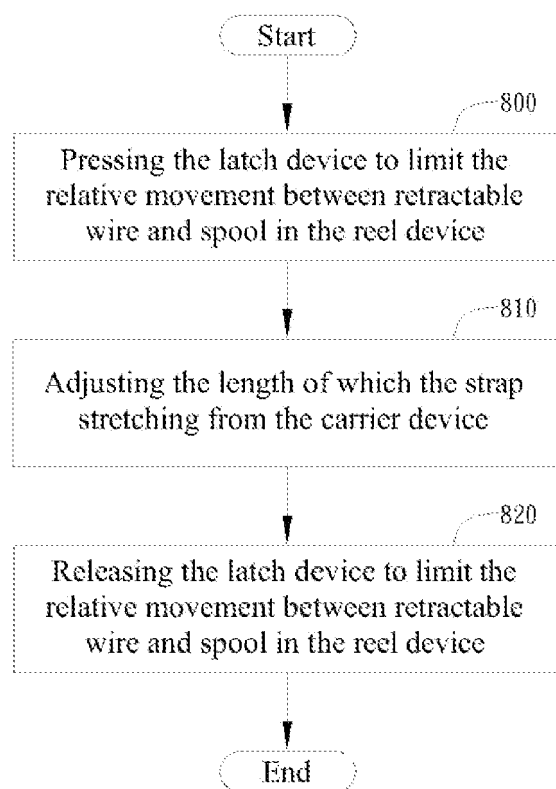


Fig. 12

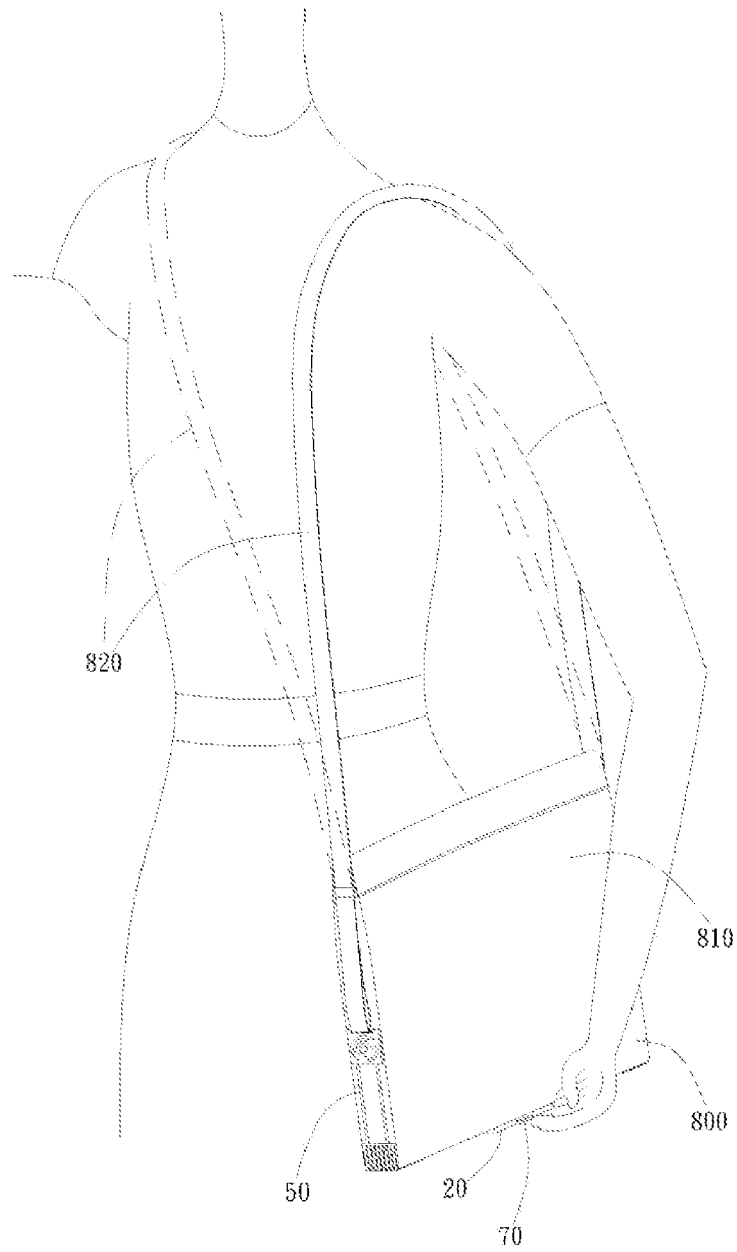


Fig. 13