



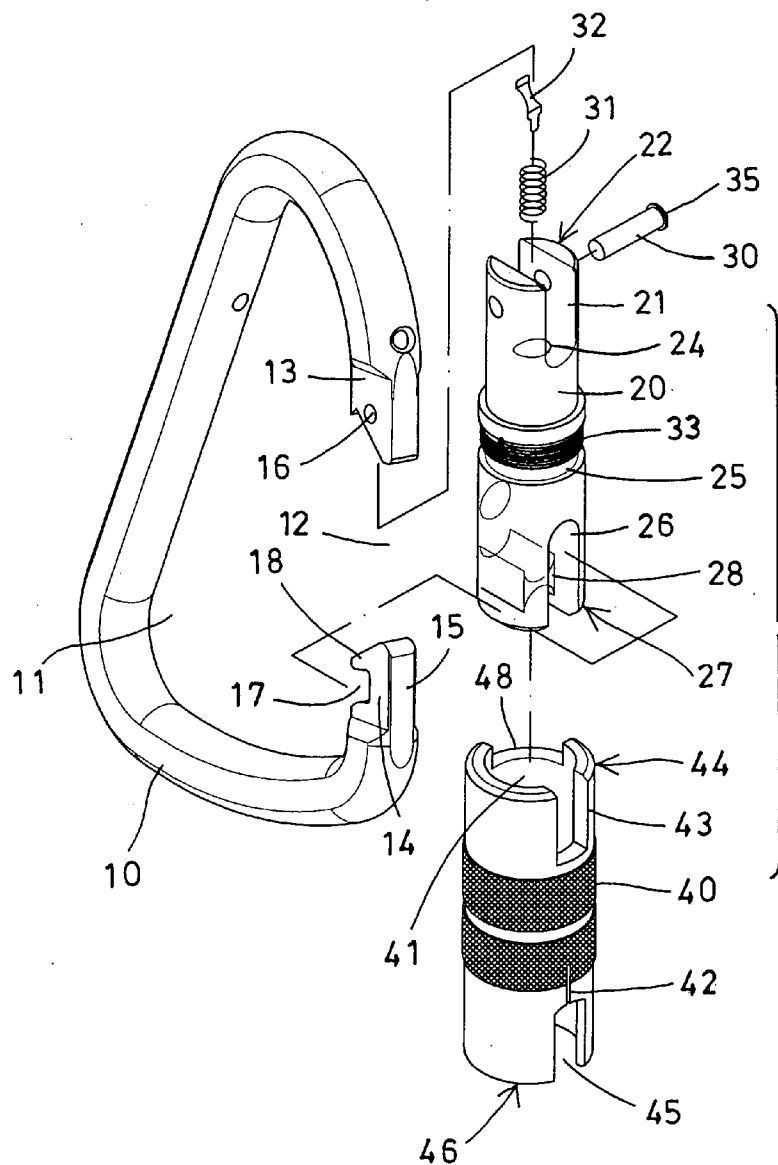
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(19) **United States**(12) **Patent Application Publication**
Liang(10) **Pub. No.: US 2010/0325848 A1**(43) **Pub. Date: Dec. 30, 2010**(54) **SNAP HOOK WITH ROTATABLE LOCK**(52) **U.S. Cl. 24/598.3; 24/598.2**(76) **Inventor: Feng Chia Liang, Taichung (TW)**(57) **ABSTRACT**

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A snap hook includes a hook member having a gap formed by an attaching end and a receiving end, a pivotal gate pivotally secured to the hook member and having a channel for receiving the receiving end of the hook member, a locking member is rotatably engaged onto the pivotal gate and includes a passage for aligning with the channel of the pivotal gate and the receiving end of the hook member and for allowing the pivotal gate and the locking member to be rotated relative to the hook member from the locking position to the unlocking position, and a spring member biases and rotates the locking member relative to the pivotal gate to stably retain the receiving end of the hook member in the channel of the pivotal gate.



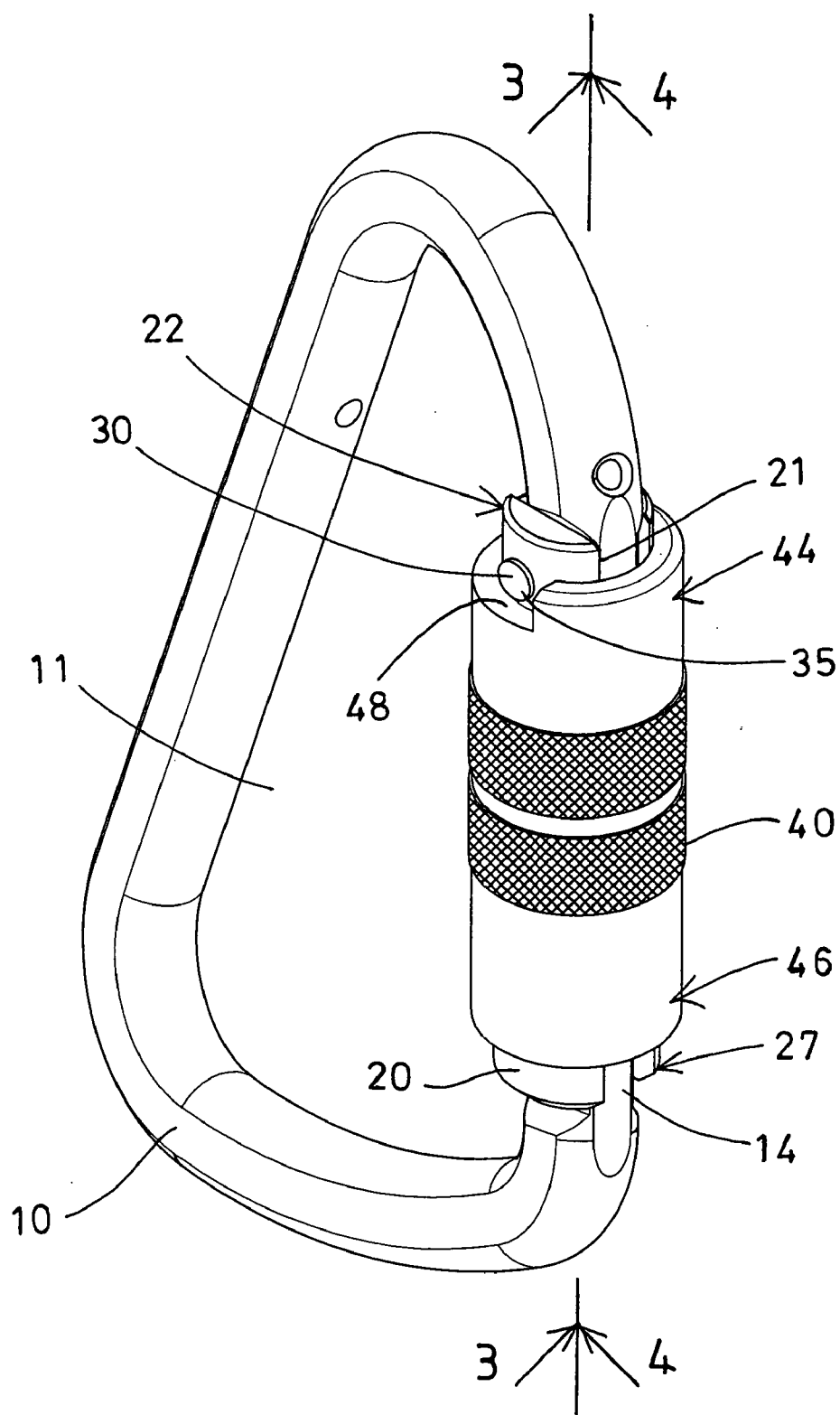


FIG. 1

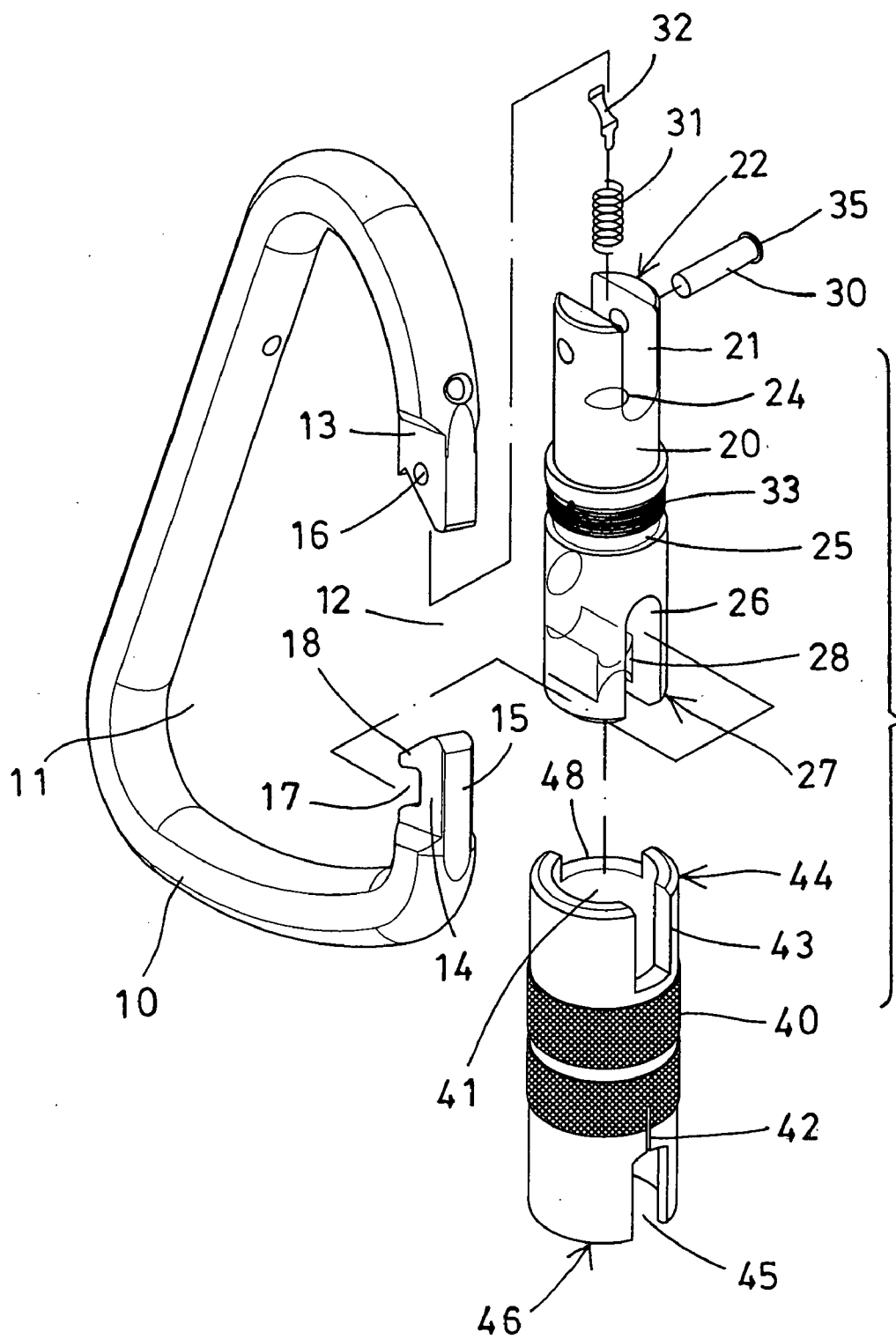


FIG. 2

FIG. 3

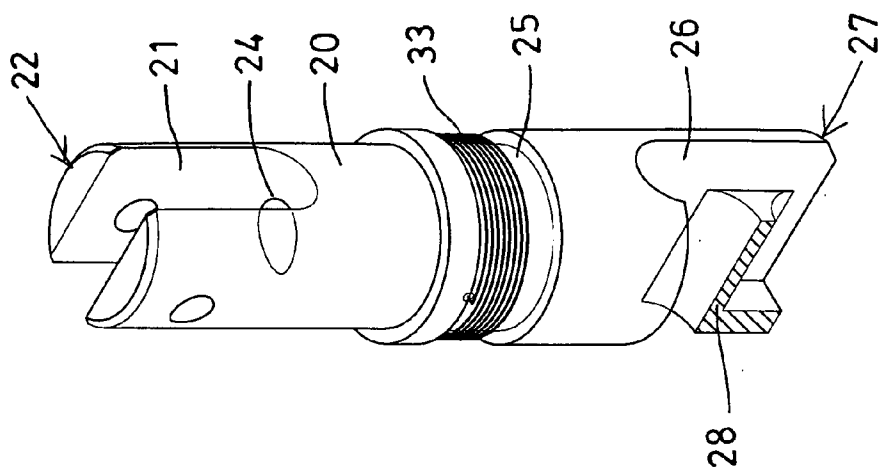


FIG. 5

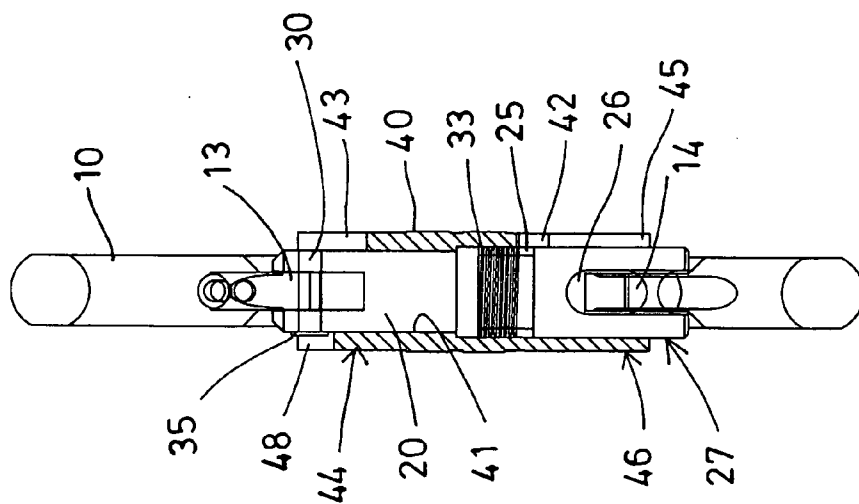


FIG. 4

SNAP HOOK WITH ROTATABLE LOCK

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a snap hook or S-hook or the like, and more particularly to a snap hook or S-hook including a rotatable safety locking member rotatably attached to a pivotal gate for solidly locking C-shaped hook body and for allowing the snap hook or S-hook to be easily operated by the user.

[0003] 2. Description of the Prior Art

[0004] Typical coupling devices or snap hooks comprise an elongated body member pivotally attached to a handle or loop and including a hook formation formed or provided on one end for engaging with a cable or other objects, and a sleeve rotatably attached onto the elongated body member and movable relative to the elongated body member for selectively locking the hook formation and thus for stably anchoring or locking or securing the cable or other objects to the elongated body member.

[0005] For example, U.S. Pat. No. 3,861,007 to Silverman discloses one of the typical swivel coupling devices comprising a central elongate body member with a hook formation formed or provided on one end and a swivel ring at the other end. A telescoping sleeve is rotatably attached onto the elongated body member and movable relative to the elongated body member for selectively locking the hook formation to form a closed loop and thus for stably anchoring or locking or securing the cable or other objects to the elongated body member.

[0006] However, the size or dimension or opening of the hook formation is limited and may not be used to lock the larger objects or the like.

[0007] U.S. Pat. No. 5,608,953 to Petzl et al. discloses another typical snap hook comprising a pivoting finger associated to a locking ring movable in rotation between a first locking position and a second unlocking position, and a locking bolt cooperates with the ring to lock the ring positively in the first locking position. However, the locking ring is rotatable relative to the pivoting finger and may not be moved longitudinally relative to the pivoting finger and thus may not be moved to solidly engage with a C-shaped metallic body.

[0008] U.S. Pat. No. 5,791,025 to Maurice et al. discloses a further typical snap hook comprising a pivoting finger with a rotary locking ring cooperating with a locking bolt, and the locking bolt includes an operating component designed to cooperate alternately with a notch arranged in the locking ring and movable in rotation between a first locking position and a second unlocking position. However, similarly, the locking ring is rotatable relative to the pivoting finger and may not be moved longitudinally relative to the pivoting finger and thus may not be moved to solidly engage with a C-shaped metallic body.

[0009] The present invention has arisen to mitigate and/or obviate the afore-described disadvantages of the conventional snap hooks or S-hooks.

SUMMARY OF THE INVENTION

[0010] The primary objective of the present invention is to provide a snap hook including a rotatable safety locking member rotatably attached to a pivotal gate and movable to engage with one end of a C-shaped hook body for solidly securing or locking the C-shaped hook body.

[0011] In accordance with one aspect of the invention, there is provided a snap hook comprising a hook member including a space formed therein, and including a gap formed therein and communicating with the space of the hook member for forming an attaching end and a receiving end, a pivotal gate including a first end pivotally secured to the attaching end of the hook member with an axle for allowing the pivotal gate to be rotated relative to the hook member between a locking position and an unlocking position, the pivotal gate including a second end having a channel formed therein for selectively receiving the receiving end of the hook member, a locking member including a bore formed therein for rotatably receiving and engaging onto the pivotal gate, and including a passage formed in a first end of the locking member for selectively aligning with the channel of the pivotal gate and the receiving end of the hook member and for allowing the pivotal gate and the locking member to be rotated relative to the hook member from the locking position to the unlocking position, and a spring member engaged with the pivotal gate and the locking member for forcing and biasing the locking member to rotate relative to the pivotal gate, and for disengaging and offsetting the passage of the locking member from the channel of the pivotal gate, and for anchoring and retaining the receiving end of the hook member in the channel of the pivotal gate and in the first end of the locking member, and for locking and retaining and latching the pivotal gate to the hook member at the locking position.

[0012] The locking member includes a groove formed in the locking member, and the axle includes a head extended out of the pivotal gate and slidably received and engaged in the groove of the locking member for guiding and limiting the locking member to rotate relative to the pivotal gate and the hook member for a limited rotational angle, and for controlling the passage of the locking member either in alignment with the channel of the pivotal gate or offset from the channel of the pivotal gate.

[0013] The locking member includes a slot formed a second end of the locking member for selectively aligning with the attaching end of the hook member and for allowing the pivotal gate and the locking member to be rotated relative to the hook member between the locking position and the unlocking position when the slot of the locking member is aligned with the attaching end of the hook member.

[0014] The pivotal gate includes a notch formed in the first end thereof for receiving the attaching end of the hook member for selectively aligning with the slot of the locking member and for allowing the pivotal gate to be rotated relative to the hook member between the locking position and the unlocking position.

[0015] The pivotal gate includes a cavity formed in the first end thereof for receiving a spring member which is engaged with the attaching end of the hook member for biasing and anchoring the pivotal gate to the hook member at the locking position.

[0016] The hook member includes a latching notch formed in the receiving end of the hook member for forming an anchoring catch in the receiving end of the hook member, and the pivotal gate includes a latch member provided in the first end of the pivotal gate and extended through the channel of the pivotal gate for selectively engaging with the latching notch of the hook member and for anchoring and latching the pivotal gate to the hook member at the locking position.

[0017] The spring member is preferably a coil spring engaged between the pivotal gate and the locking member for

forcing and biasing the locking member to rotate relative to the pivotal gate, and for disengaging and offsetting the passage of the locking member from the channel of the pivotal gate.

[0018] Further objectives and advantages of the present invention will become apparent from a careful reading of the detailed description provided hereinbelow, with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] FIG. 1 is a perspective view of a snap hook in accordance with the present invention;

[0020] FIG. 2 is an exploded view of the snap hook;

[0021] FIG. 3 is a partial cross sectional view of the snap hook taken along lines 3-3 of FIG. 1;

[0022] FIG. 4 is another partial cross sectional view of the snap hook taken along lines 4-4 of FIG. 1; and

[0023] FIG. 5 is a perspective view illustrating a pivotal gate of the snap hook.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0024] Referring to the drawings, and initially to FIGS. 1-4, a snap hook in accordance with the present invention comprises a C-shaped hook body or member 10 including a space 11 formed therein for receiving one or more cables (not shown) or other objects, and including a gap 12 formed therein and communicating with the space 11 thereof for forming or defining two free ends 13, 14, such as a first or attaching end 13 and a second or receiving end 14. It is preferable that the C-shaped hook member 10 is bent or formed with an elongated rod which includes a circular or substantially circular cross section, and the hook member 10 includes one or more cut-off portions 15 formed in each of the free ends 13, 14 for forming a flat structure or a square or rectangular cross section for each of the free ends 13, 14.

[0025] The hook member 10 further includes an orifice 16 formed in one end 13, such as formed in the attaching end 13 thereof, and a latching notch 17 formed in the other or second end 14, such as formed in the receiving end 14 thereof for forming or defining an anchoring catch 18 on the other end or the receiving end 14 thereof. A pivotal shank or gate 20 includes a notch 21 formed in one or first end 22 thereof for receiving the attaching end 13 of the hook member 10, an axle 30 is attached to the first end 22 of the pivotal gate 20 and engaged through the notch 21 of the pivotal gate 20 and further engaged through the orifice 16 at the attaching end 13 of the hook member 10 for pivotally or rotatably attaching or securing the pivotal gate 20 to the hook member 10 and for allowing the pivotal gate 20 to be rotated relative to the hook member 10 between a first locking position (FIGS. 1, 3, 4) and a second unlocking position (not shown).

[0026] The pivotal gate 20 further includes a cavity 24 formed in the first end 22 thereof for receiving a spring member 31 and/or a spring blade or positioning member 32 (FIG. 2) which may be biased by the spring member 31 to engage with the attaching end 13 of the hook member 10 for biasing and anchoring or positioning the pivotal gate 20 to the hook member 10 at the first locking position (FIGS. 1, 3, 4). One example of the operation or the engagement of the spring member 31 and/or the spring blade or positioning member 32 with the attaching end 13 of the hook member 10 is typical and has been disclosed in U.S. Pat. No. 5,608,953 to Petzl et

al. which may then be taken as a reference for the present invention. It is preferable that the pivotal gate 20 further includes a peripheral recess 25 formed in the middle portion thereof for receiving or engaging with a spring biasing means or device or a spring member 33, such as a coil spring 33 which may be engaged onto the pivotal gate 20.

[0027] The pivotal gate 20 further includes a channel 26 formed in the other or second or latching end 27 thereof for selectively receiving the receiving end 14 and the anchoring catch 18 of the hook member 10, and includes a latch member 28 attached to or formed in the second end 27 of the pivotal gate 20 and engaged or extended through the channel 26 of the pivotal gate 20 for selectively engaging with the latching notch 17 of the hook member 10 (FIG. 3) and for anchoring or latching the pivotal gate 20 to the hook member 10 at the first locking position (FIGS. 1, 3, 4). The pivotal gate 20 may also be pivoted or rotated relative to the hook member 10 to the second unlocking position for selectively disengaging the latch member 28 from the latching notch 17 of the hook member 10 and for allowing the cables or other objects to be engaged into the space 11 via the gap 12 of the hook member 10.

[0028] The snap hook further includes a rotatable sleeve or tubular or cylindrical safety locking member 40 having a bore 41 formed therein for rotatably receiving or engaging onto the pivotal gate 20 and rotatable relative to the pivotal gate 20, the safety locking member 40 includes a slit 42 formed therein (FIG. 2) for receiving or engaging with the spring member 33 which may be engaged with the pivotal gate 20 and the safety locking member 40 for forcing or biasing the safety locking member 40 to rotate relative to the pivotal gate 20 and to lock or retain the receiving end 14 and the anchoring catch 18 of the hook member 10 within the channel 26 of the pivotal gate 20, and for selectively or solidly latching or locking the pivotal gate 20 to the hook member 10 at the first locking position (FIG. 1) and thus for preventing the pivotal gate 20 from being rotated away from the hook member 10 to the second unlocking position.

[0029] The safety locking member 40 includes a slot 43 formed in one or first end 44 thereof for selectively aligning with the notch 21 of the pivotal gate 20 and the attaching end 13 of the hook member 10 and for allowing the pivotal gate 20 and the safety locking member 40 to be rotated relative to the hook member 10 between the first locking position (FIGS. 1, 3, 4) and the second unlocking position (not shown), and includes a passage 45 formed in the other or second end 46 thereof for selectively aligning with the channel 26 of the pivotal gate 20 and the receiving end 14 of the hook member 10 and for allowing the pivotal gate 20 and the safety locking member 40 to be rotated relative to the hook member 10 from the first locking position (FIGS. 1, 3, 4) to the second unlocking position.

[0030] The spring member 33 may force or bias the safety locking member 40 to rotate relative to the pivotal gate 20 and to move or disengage or offset the slot 43 and the passage 45 of the safety locking member 40 from the notch 21 and the channel 26 of the pivotal gate 20 and to stably anchor and retain the attaching end 13 of the hook member 10 within the notch 21 of the pivotal gate 20 and to stably anchor and retain the receiving end 14 of the hook member 10 within the channel 26 of the pivotal gate 20, and thus to stably lock or retain the receiving end 14 and the anchoring catch 18 of the hook member 10 and the second end 27 of the pivotal gate 20 within the other or second end 46 of the safety locking member 40,

and for selectively or solidly latching or locking the pivotal gate 20 to the hook member 10 at the first locking position.

[0031] It is preferable that the safety locking member 40 further includes a groove 48 formed in the one or first end 44 of the safety locking member 40, and the axle 30 may include one end or enlarged end or head 35 formed therein and extended out of the pivotal gate 20 and slidably received and engaged in the groove 48 of the safety locking member 40 for guiding and limiting the safety locking member 40 to rotate relative to the pivotal gate 20 and the hook member 10 for a limited rotational angle, and for controlling the slot 43 and the passage 45 of the safety locking member 40 either in alignment with the notch 21 and the channel 26 of the pivotal gate 20 or offset from the notch 21 and the channel 26 of the pivotal gate 20.

[0032] It is to be noted that the safety locking member 40 is not required to slide longitudinally relative to the pivotal gate 20 and is only required to rotate relative to the pivotal gate 20 and the hook member 10 such that the length of the safety locking member 40 may be suitably reduced, or the length of the safety locking member 40 is not required to be increased, and the safety locking member 40 is only required to be rotated relative to the pivotal gate 20 and the hook member 10 by the hand of the user that holds the hook member 10 such that the snap hook may be easily operated by the single hand of the user. It is further to be noted that the safety locking member 40 may be formed shorter to have the one or first end 44 of the safety locking member 40 disengaged or offset from the notch 21 of the pivotal gate 20 and the attaching end 13 of the hook member 10, and the other or second end 46 of the safety locking member 40 may also be good enough to selectively or solidly latch or lock the pivotal gate 20 to the hook member 10 at the first locking position.

[0033] In operation, it is only required to rotate the safety locking member 40 relative to the pivotal gate 20 and the hook member 10 for a limited rotational angle to align the slot 43 and the passage 45 of the safety locking member 40 with the notch 21 and the channel 26 of the pivotal gate 20 and to allow the pivotal gate 20 and the safety locking member 40 to be rotated relative to the hook member 10 from the locking position to the unlocking position. When it is required to latch or lock the pivotal gate 20 to the hook member 10, it is only required to release the safety locking member 40, and the spring member 33 may bias and force and rotate the safety locking member 40 relative to the pivotal gate 20 and the hook member 10, in order to disengage or offset the slot 43 and the passage 45 of the safety locking member 40 from the notch 21 and the channel 26 of the pivotal gate 20.

[0034] At this moment, the attaching end 13 of the hook member 10 may be stably anchored and retained within the notch 21 of the pivotal gate 20, and the receiving end 14 of the hook member 10 may be stably anchored and retained within the channel 26 of the pivotal gate 20, and the receiving end 14 and the anchoring catch 18 of the hook member 10 and the second end 27 of the pivotal gate 20 may be stably anchored and retained within the other or second end 46 of the safety locking member 40, and thus the pivotal gate 20 may be stably and solidly anchored and retained and latched or locked to the hook member 10 at the first locking position.

[0035] Accordingly, the snap hook in accordance with the present invention includes a rotatable safety locking member rotatably attached to the pivotal gate and movable to engage with one end of the C-shaped hook body for solidly securing or locking the C-shaped hook body.

[0036] Although this invention has been described with a certain degree of particularity, it is to be understood that the present disclosure has been made by way of example only and that numerous changes in the detailed construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

I claim:

1. A snap hook comprising:

- a hook member including a space formed therein, and including a gap formed therein and communicating with said space of said hook member for forming an attaching end and a receiving end,
- a pivotal gate including a first end pivotally secured to said attaching end of said hook member with an axle for allowing said pivotal gate to be rotated relative to said hook member between a locking position and an unlocking position, said pivotal gate including a second end having a channel formed therein for selectively receiving said receiving end of said hook member,
- a locking member including a bore formed therein for rotatably receiving and engaging onto said pivotal gate, and including a passage formed in a first end of said locking member for selectively aligning with said channel of said pivotal gate and said receiving end of said hook member and for allowing said pivotal gate and said locking member to be rotated relative to said hook member from the locking position to the unlocking position, and
- a spring member engaged with said pivotal gate and said locking member for forcing and biasing said locking member to rotate relative to said pivotal gate, and for disengaging and offsetting said passage of said locking member from said channel of said pivotal gate, and for anchoring and retaining said receiving end of said hook member in said channel of said pivotal gate and in said first end of said locking member, and for locking and retaining and latching said pivotal gate to said hook member at the locking position.

2. The snap hook as claimed in claim 1, wherein said locking member includes a groove formed in said locking member, and said axle includes a head extended out of said pivotal gate and slidably received and engaged in said groove of said locking member for guiding and limiting said locking member to rotate relative to said pivotal gate and said hook member for a limited rotational angle, and for controlling said passage of said locking member either in alignment with said channel of said pivotal gate or offset from said channel of said pivotal gate.

3. The snap hook as claimed in claim 1, wherein said locking member includes a slot formed a second end of said locking member for selectively aligning with said attaching end of said hook member and for allowing said pivotal gate and said locking member to be rotated relative to said hook member between the locking position and the unlocking position when said slot of said locking member is aligned with said attaching end of said hook member.

4. The snap hook as claimed in claim 3, wherein said pivotal gate includes a notch formed in said first end thereof for receiving said attaching end of said hook member for selectively aligning with said slot of said locking member.

5. The snap hook as claimed in claim 1, wherein said pivotal gate includes a cavity formed in said first end thereof for receiving a spring member which is engaged with said

attaching end of said hook member for biasing and anchoring said pivotal gate to said hook member at the locking position.

6. The snap hook as claimed in claim 1, wherein said hook member includes a latching notch formed in said receiving end of said hook member for forming an anchoring catch in said receiving end of said hook member, and said pivotal gate includes a latch member provided in said first end of said pivotal gate and extended through said channel of said pivotal

gate for selectively engaging with said latching notch of said hook member and for anchoring and latching said pivotal gate to said hook member at the locking position.

7. The snap hook as claimed in claim 1, wherein said spring member is a coil spring engaged between said pivotal gate and said locking member.

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