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Inventor(s)

Faizan; Mirza et al.

KNIFE HOLDER FOR A KNIFE

Abstract

A knife holder for holding a knife includes a block defining a cavity to receive the knife, and a casing removably arranged inside the cavity and adapted to be locked with the block. The knife is removably arranged inside the casing. A lock structure locks the casing with the block to prevent the removal of the casing from the cavity. Moreover, a switch is adapted to be actuated by a user to enable an unlocking of the casing from the block to enable a removal of the casing from the block. A near field communication device is configured to determine a presence of an authorized user in a vicinity of the knife holder and facilitates an unlocking of the casing from the block in response to an actuation of the switch in the presence of the authorized user in the vicinity of the knife holder.

Inventors: Faizan; Mirza (Irving, TX), Patel; Aarav (Frisco, TX), Kommidi; Akshara (Plano, TX), Ali; Ishaq Mohammed (Plano, TX), Ali; Ismail Mohammed (Plano, TX), Bhojani; Raisha (Euleess, TX), Ismail; Eyad (Southlake, TX), Simhambhatla; Manyatha (Frisco, TX), Khan; Zaynab (Murphy, TX), Azigar Ali; Sheik Ahamed (Frisco, TX), Ahmad; Hisham (Allen, TX), Rizwan; Mirza (Patna, IN), Haque; Ashaz (Patna, IN), Fatima; Aarifa (Patna, IN), Asaf; Saadia (Aligarh, IN), Khan; Mansoor Hasan (Aligarh, IN)

Applicant: Faizan; Mirza (Irving, TX)

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Background/Summary

BACKGROUND

1. Technical Field

[0001] The present disclosure relates, generally, to a knife holder, and more particularly to a knife assembly having a knife holder and a knife that prevents removal of the knife from the knife holder to an unauthorized user.

2. Description of the Prior Art

[0002] Generally, a knife is a tool having at least one sharp edge used for cutting different edible items in every household. In a residential house, sometimes parents unconsciously leave it in a place for e.g. a kitchen sink etc. from where it becomes easily accessible to children. In the absence of parents' sight, some children might play with the knife. While playing with the knife, the children are vulnerable to a chance of being injured due to the sharp edges of the knife.

SUMMARY

[0003] In one aspect, a knife holder for holding a knife is disclosed. The knife holder includes a block defining at least one cavity to receive the at least one knife, and at least one casing removably arranged inside the at least one cavity and adapted to be locked with the block. The at least one knife is removably arranged inside the at least one casing. The knife holder further includes a lock structure configured to lock the at least one casing with the block to prevent the removal of the at least one casing from the at least one cavity, and a switch adapted to be actuated by a user to enable an unlocking of the at least one casing from the block to enable a removal of the at least one casing from the block. The knife holder also includes a near field communication device configured to determine a presence of an authorized user in a vicinity of the knife holder and facilitates an unlocking of the at least one casing from the block in response to an actuation of the switch in the presence of the authorized user in the vicinity of the knife holder.

[0004] In some additional, alternative, or selectively cumulative embodiments, the knife holder further includes an actuator adapted to move the lock structure to an unlock state based on a signal received from the near field communication device and the actuation of the switch.

[0005] In some additional, alternative, or selectively cumulative embodiments, the lock structure is a first lock structure and the knife holder includes a second lock structure to lock the at least one knife with the at least one casing.

[0006] In some additional, alternative, or selectively cumulative embodiments, the second lock structure includes a gear adapted to be engaged with the associated knife. The knife includes a plurality of teeth extending along a non-cutting edge of the knife and the gear engages with the plurality of teeth upon insertion of the knife inside the at least one casing.

[0007] In some additional, alternative, or selectively cumulative embodiments, the gear includes a groove, and the second lock structure includes a pin adapted to be displaced to an extended position and a retracted position. In the extended position, the pin extends inside the groove locking the gear with knife, and in the retracted position, the pin is arranged outwardly of the groove enabling a rotation of the gear and removal of the knife from the associated casing.

[0008] In some additional, alternative, or selectively cumulative embodiments, the knife holder further includes at least one second actuator to displace the pin from the extended position to the retracted position in response to at least one of a signal received from the near field communication device or the actuation of the switch.

[0009] In some additional, alternative, or selectively cumulative embodiments, the at least casing

includes a first half portion and a second half portion removably or pivotably engaged with the first half portion.

[0010] In accordance with an embodiment of the disclosure, a knife assembly is disclosed. The knife assembly includes at least one knife and a knife holder to securely hold the at least one knife. The knife holder includes a block defining at least one cavity to receive the at least one knife, and at least one casing removably arranged inside the at least one cavity and adapted to be locked with the block. The at least one knife is removably arranged inside the at least one casing. The knife holder further includes a lock structure configured to lock the at least one casing with the block to prevent the removal of the at least one casing from the at least one cavity, a switch adapted to be actuated by a user to enable an unlocking of the at least one casing from the block to enable a removal of the at least one casing from the block and a near field communication device configured to determine a presence of an authorized user in a vicinity of the knife holder and facilitates an unlocking of the at least one casing from the block in response to an actuation of the switch in the presence of the authorized user in the vicinity of the knife holder.

[0011] In some additional, alternative, or selectively cumulative embodiments, the knife holder further includes an actuator adapted to move the lock structure to an unlock state based on a signal received from the near field communication device and the actuation of the switch.

[0012] In some additional, alternative, or selectively cumulative embodiments, the lock structure is a first lock structure and the knife holder includes a second lock structure to lock the at least one knife with the at least one casing.

[0013] In some additional, alternative, or selectively cumulative embodiments, the knife includes a plurality of teeth extending along a non-cutting edge of the knife, and the second lock structure includes a gear mounted to the block and adapted to be engaged with the plurality of teeth upon insertion of the knife inside the at least one casing.

[0014] In some additional, alternative, or selectively cumulative embodiments, the gear includes a groove, and the second lock structure includes a pin adapted to be displaced to an extended position and a retracted position. In the extended position, the pin extends inside the groove locking the gear with knife, and in the retracted position, the pin is arranged outwardly of the groove enabling a rotation of the gear and removal of the knife from the associated casing.

[0015] In some additional, alternative, or selectively cumulative embodiments, the knife holder further includes at least one second actuator to displace the pin from the extended position to the retracted position in response to at least one of a signal received from the near field communication device or the actuation of the switch.

[0016] In some additional, alternative, or selectively cumulative embodiments, the at least casing includes a first half portion and a second half portion removably or pivotably engaged with the first half portion.

[0017] In some additional, alternative, or selectively cumulative embodiments, the knife assembly further includes a wearable device adapted to be worn by a user and configured to communicate with the near field communication device. The near field communication device determines the presence of the authorized user based on a signal received from the wearable device.

[0018] In accordance with an embodiment of the disclosure, a knife assembly is disclosed. The knife assembly includes at least one knife and a knife holder to securely hold the at least one knife. The knife holder includes a block defining at least one cavity to receive the at least one knife, and at least one casing removably arranged inside the at least one cavity and adapted to be locked with the block. The at least one knife is removably arranged inside the at least one casing. The knife holder further includes a lock structure mounted to the block and configured to lock the at least one casing with the block to prevent the removal of the at least one casing from the at least one cavity, and a switch mounted to the block and adapted to be actuated by a user to enable an unlocking of the at least one casing from the block to enable a removal of the at least one casing from the block. Moreover, the knife holder includes a near field communication device configured

to determine a presence of an authorized user in a vicinity of the knife holder, and an actuator adapted to move the lock structure to an unlock state to unlock the at least one casing from the block in response to an actuation of the switch and a signal received from the near field communication device. The knife assembly further includes a wearable device adapted to be worn by a user and configured to communicate with the near field communication device. The near field communication device determines the presence of the authorized user based on a signal received from the wearable device.

[0019] In some additional, alternative, or selectively cumulative embodiments, the lock structure is a first lock structure and the knife holder includes a second lock structure to lock the at least one knife with the at least one casing.

[0020] In some additional, alternative, or selectively cumulative embodiments, the knife includes a plurality of teeth extending along a non-cutting edge of the knife, and the second lock structure includes a gear mounted to the block and adapted to be engaged with the plurality of teeth upon insertion of the knife inside the at least one casing.

[0021] In some additional, alternative, or selectively cumulative embodiments, the gear includes a groove, and the second lock structure includes a pin adapted to be displaced to an extended position and a retracted position. In the extended position, the pin extends inside the groove locking the gear with knife, and in the retracted position, the pin is arranged outwardly of the groove enabling a rotation of the gear and removal of the knife from the associated casing.

[0022] In some additional, alternative, or selectively cumulative embodiments, the knife holder further includes at least one second actuator to displace the pin from the extended position to the retracted position in response to at least one of a signal received from the near field communication device or the actuation of the switch.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] FIG. 1 is a front view of a knife assembly depicting a knife extending inside a knife holder, in accordance with one embodiment of the present disclosure;

[0024] FIG. 2 is a schematic front view of the knife assembly depicting internal components of the knife holder, in accordance with one embodiment of the present disclosure;

[0025] FIG. 3 is a schematic view of a casing of the knife holder having a first half portion and a second half portion, in accordance with one embodiment of the present disclosure; and

[0026] FIG. 4 is a schematic side view of the knife holder depicting a second lock structure of the knife holder, in accordance with one embodiment of the present disclosure.

DETAILED DESCRIPTION

[0027] Referring to FIG. 1, a knife assembly **100** having at least one knife **102** and a knife holder **104** to hold the at least one knife **102** is disclosed. Referring to FIG. 2, the knife **102** includes a blade **108** and a handle **110** extending longitudinally from the blade **108**. Moreover, the blade **108** includes a cutting edge **112** to enable a cutting of an object and a non-cutting edge **114** arranged opposite to the cutting edge **112**. In the illustrated embodiments, the knife **102** includes a plurality of teeth **116** extending along at least a portion of the non-cutting edge **114** to enable a locking of the knife **102** with the knife holder **104**.

[0028] As shown, the knife holder **104** includes a block **120** having a first end **122** i.e., top end **122** and a second end **124** i.e., bottom end **124**, and defines at least one cavity **126** to receive the least one knife **102**. The cavity **126** extends from the top end **122** towards the bottom end **124** with an opening **128** of the cavity **126** disposed at the top end **122** to enable an insertion and removal of the knife **102** from the cavity **126**. It may be appreciated that although a single cavity **126** is shown and contemplated, the block **120** may define a plurality of cavities to hold and retain a plurality of

knives.

[0029] Moreover, the knife holder **104** includes a casing **130** removably arranged inside the cavity **126** and the knife **102** (i.e., blade **108**) is arranged inside the casing **130** when inserted inside the knife holder **104**. In some embodiments, the casing **130** may be made of a suitable material that prevents/restricts a damage of the cutting edge **112** of the blade **108** during insertion and removal of the knife **102** inside the casing **130**. In some embodiments, as shown in FIG. 3, the casing **130** includes a first half portion **132** and a second half portion **134** removably or pivotably engaged with the first half portion **132**. By having the two half portions **132**, **134**, the casing **130** may be cleaned from inside.

[0030] Further, the casing **130** is adapted to be locked with the block **120** to prevent any unauthorized removal of the casing **130** from the cavity **126**. Referring again to FIG. 2, to lock the casing **130** with the block **120**, the knife holder **104** includes a lock structure **138**, for example, a first lock structure **138**, mounted to the block **120** and adapted to be displaced between a lock state and an unlock state. In the lock state, the first lock structure **138** locks the casing **130** with the block **120** and prevents the removal of the casing **130** from the cavity **126**, while in the unlock state, the first lock structure **138** allows the removal of the casing **130** from the cavity **126**. In some embodiments, the first lock structure **138** includes a pin **140** mounted to the block **120** and adapted to extend and retract relative to the block **120**.

[0031] In the lock state, the pin **140** is engaged to the casing **130**, while in the unlock state, the pin **140** is arranged distally from the casing **130**. In some embodiments, as shown in FIG. 2, a spring **142** may be arranged between the casing **130** and an inner surface of the block **120**. The spring **142** is adapted to push the casing **130** upwardly in response to the movement of the first lock structure **138** to the unlock state. Accordingly, the spring **142** is compressed when the casing **130** is arranged inside cavity **126** and locked with the block **120**. To move the pin **140** and hence the first lock structure **138** between the lock state and the unlock state, the knife holder **104** includes an actuator **144**, for example, a first actuator **144**. In an embodiment, the first actuator **144** is a solenoid operated actuator **146** that displaces the pin **140** to unlock the casing **130** from the block **120**. In an embodiment, the solenoid operated actuator **146** may be a solenoid operated linear actuator, for example, an electric motor, a cylinder, or any other actuator known in the art.

[0032] Further, the first actuator **144** moves the first lock structure **138** to the unlock state based on an input received from an authorized user. To facilitate the operation/actuation of the first actuator **144** by the authorized user, the knife holder **104** includes a switch **150** adapted to be actuated by an authorized user and is coupled to the block **120**. To facilitate a determination that the switch **150** is actuated by the authorized user, the knife holder **104** includes a near field communication (NFC) device **152** that interacts with a wearable device **200** having a NFC unit **202** that interacts with NFC device **152**, and the NFC device based on the interaction with NFC unit **202** determines if the user is an authorized user or not. In an embodiment, the wearable device **200** may be a band, a ring, a strap, or any other such device, adapted to be worn by the user. Accordingly, the switch **150** actuates the first actuator **144** only when the switch **150** is operated when the wearable device **200** is within a close proximity, i.e., predetermined distance, of the block **120**. Upon actuation of the first actuator **144**, the first actuator **144** moves the lock structure **138** to the unlock state i.e., retracts the pin **140**, thereby unlocking the casing **130** from the block **120**.

[0033] Additionally, the knife holder **104** includes at least one second lock structure **160** to lock the knife **102** with the casing **130** and/or the block **120**. As shown, each second lock structure **160** includes a gear **162** mounted to the casing **130** or the block **120** and extending at least partially inside casing **130**. The gear **162** is arranged to engage with the plurality of teeth **116** of the knife **102** when the knife **102** is disposed inside the casing **130** or inserted inside the casing **130**. Further, the second lock structure **160** includes a pin **164** movably coupled to the block **120** or the casing **130** and configured to engage with the gear **162** to prevent a rotation of the gear **162** and thereby lock the gear **162** with the teeth **116** of the knife **102**, and hence locking the knife **102** inside the

knife holder **104**.

[0034] In the illustrated embodiment, the pin **164** is arranged to be displaced between an extended position and a retracted position. To facilitate the engagement of the pin **164** with the gear **162** and prevent the rotation of the gear **162**, the gear **162** defines at least one groove **166** in which the pin **164** extends in the extended position. In an embodiment, the groove **166** may be an arcuate groove extending arcuately around a central axis of the gear **162**. It may be appreciated that in the retracted position, the pin **164** is arranged away/outwardly of the groove **166**. Accordingly, to remove the knife **102** from the knife holder **104**, the pin **164** is moved to the retracted position to allow the rotation of the gear **162** about its central axis, which in turn allows the removal of the knife **102** from the casing **130** i.e., knife holder **104**.

[0035] Referring to FIG. 4, to move/displace the pin **164** to the retracted position, the knife holder **104** includes a second actuator **170** that may be a solenoid operated actuator **172**. It may be appreciated that the second actuator **170** is actuated simultaneously with the first actuator **144** upon actuation of the switch **150** by the authorized user i.e., the user having/wearing the wearable device **200**. It may be appreciated that the pin **164** is biased to the extended position and moves to a retracted position upon actuation of the second actuator **170**.

[0036] Furthermore, in some embodiments, the knife holder **104** includes a battery **180** (shown in FIG. 2) to power one or more electrical and electronic components of the knife holder **104**. Further, the knife holder **104** may include a dynamo **182**, as shown in FIG. 2, to generate electric power in response to the rotation of the gear **162** during the removal and insertion of the knife **102** inside the casing **130** i.e., block **120** to generate electric power that is used to recharge the battery **180**. In some embodiments, the battery **180** may be a non-rechargeable battery. In some embodiments, the dynamo **182** may be omitted, and the battery **180** may be charged by electrically connecting the battery **180** to an external power source via suitable electric wire.

[0037] The foregoing description of embodiments and examples has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the forms described. Numerous modifications are possible in light of the above teachings. Some of those modifications have been discussed and others will be understood by those skilled in the art. The embodiments were chosen and described in order to best illustrate certain principles and various embodiments as are suited to the particular use contemplated. The scope of the invention is, of course, not limited to the examples or embodiments set forth herein, but can be employed in any number of applications and equivalent devices by those of ordinary skill in the art. Rather it is hereby intended that the scope of the invention be defined by the claims appended hereto.

Claims

1. A knife holder for holding at least one knife, the knife holder comprising: a block defining at least one cavity to receive the at least one knife; at least one casing removably arranged inside the at least one cavity and adapted to be locked with the block, the at least one knife is removably arranged inside the at least one casing; a lock structure configured to lock the at least one casing with the block to prevent the removal of the at least one casing from the at least one cavity, wherein the lock structure is a first lock structure and the knife holder includes a second lock structure to lock the at least one knife with the at least one casing, and the second lock structure includes a gear adapted to be engaged with the associated knife, wherein the knife includes a plurality of teeth extending along a non-cutting edge of the knife and the gear engages with the plurality of teeth upon insertion of the knife inside the at least one casing; a switch adapted to be actuated by a user to enable an unlocking of the at least one casing from the block to enable a removal of the at least one casing from the block; and electronic circuitry configured to determine a presence of an authorized user in a vicinity of the knife holder and facilitates an unlocking of the at least one casing from the block in response to an actuation of the switch in the presence of the authorized

user in the vicinity of the knife holder.

2. The knife holder of claim 1, further including a first actuator adapted to move the lock structure to an unlock state based on a signal received from the electronic circuitry and the actuation of the switch.

3. (canceled)

4. (canceled)

5. The knife holder of claim 1, wherein the gear includes a groove, and the second lock structure includes a pin adapted to be displaced to an extended position and a retracted position, wherein in the extended position, the pin extends inside the groove locking the gear with knife, and in the retracted position, the pin is arranged outwardly of the groove, enabling a rotation of the gear and removal of the knife from the associated casing.

6. The knife holder of claim 5 further comprising at least one second actuator to displace the pin from the extended position to the retracted position in response to at least one of a signal received from the electronic circuitry or the actuation of the switch.

7. The knife holder of claim 1, wherein the at least casing includes a first half portion and a second half portion removably or pivotably engaged with the first half portion.

8. A knife assembly, comprising: at least one knife; and a knife holder to securely hold the at least one knife, the knife holder includes a block defining at least one cavity to receive the at least one knife, at least one casing removably arranged inside the at least one cavity and adapted to be locked with the block, wherein the at least one knife is removably arranged inside the at least one casing, a lock structure mounted to the block and configured to lock the at least one casing with the block to prevent the removal of the at least one casing from the at least one cavity, wherein the lock structure is a first lock structure and the knife holder includes a second lock structure to lock the at least one knife with the at least one casing, and the second lock structure includes a gear adapted to be engaged with the associated knife, wherein the knife includes a plurality of teeth extending along a non-cutting edge of the knife and the gear engages with the plurality of teeth upon insertion of the knife inside the at least one casing, a switch mounted to the block and adapted to be actuated by a user to enable an unlocking of the at least one casing from the block to enable a removal of the at least one casing from the block, and electronic circuitry configured to determine a presence of an authorized user in a vicinity of the knife holder and facilitates an unlocking of the at least one casing from the block in response to an actuation of the switch in the presence of the authorized user in the vicinity of the knife holder.

9. The knife assembly of claim 8, wherein the knife holder further includes a first actuator adapted to move the lock structure to an unlock state based on a signal received from the electronic circuitry and the actuation of the switch.

10. (canceled)

11. (canceled)

12. The knife assembly of claim 8, wherein the gear includes a groove, and the second lock structure includes a pin adapted to be displaced to an extended position and a retracted position, wherein in the extended position, the pin extends inside the groove locking the gear with teeth of the knife, and in the retracted position, the pin is arranged outwardly of the groove, enabling a rotation of the gear to facilitate a removal of the knife from the associated casing.

13. The knife assembly of claim 12, wherein the knife holder further includes at least one second actuator to displace the pin from the extended position to the retracted position in response to at least one of a signal received from the electronic circuitry or the actuation of the switch.

14. The knife assembly of claim 8, wherein the at least casing includes a first half portion and a second half portion removably or pivotably engaged with the first half portion.

15. The knife assembly of claim 8 further including a wearable device adapted to be worn by a user and configured to communicate with the electronic circuitry, wherein the electronic circuitry determines the presence of the authorized user based on a signal received from the wearable device.

16. A knife assembly, comprising: at least one knife; a knife holder to securely hold the at least one knife, the knife holder includes a block defining at least one cavity to receive the at least one knife, at least one casing removably arranged inside the at least one cavity and adapted to be locked with the block, wherein the at least one knife is removably arranged inside the at least one casing, a lock structure mounted to the block and configured to lock the at least one casing with the block to the prevent the removal of the at least one casing from the at least one cavity, wherein the lock structure is a first lock structure and the knife holder includes a second lock structure to lock the at least one knife with the at least one casing, and the second lock structure includes a gear adapted to be engaged with the associated knife, wherein the knife includes a plurality of teeth extending along a non-cutting edge of the knife and the gear engages with the plurality of teeth upon insertion of the knife inside the at least one casing; a switch mounted to the block and adapted to be actuated by a user to enable an unlocking of the at least one casing from the block to enable a removal of the at least one casing from the block, electronic circuitry configured to determine a presence of an authorized user in a vicinity of the knife holder, and a first actuator adapted to move the lock structure to an unlock state to unlock the at least one casing from the block in response to an actuation of the switch and a signal received from the electronic circuitry; and a wearable device adapted to be worn by a user and configured to communicate with the electronic circuitry, wherein the electronic circuitry determines the presence of the authorized user based on a signal received from the wearable device.

17. (canceled)

18. (canceled)

19. The knife assembly of claim 16, wherein the gear includes a groove, and the second lock structure includes a pin adapted to be displaced to an extended position and a retracted position, wherein in the extended position, the pin extends inside the groove locking the gear with teeth of the knife, and in the retracted position, the pin is arranged outwardly of the groove, enabling a rotation of the gear to facilitate a removal of the knife from the associated casing.

20. The knife assembly of claim 19, wherein the knife holder further includes at least one second actuator to displace the pin from the extended position to the retracted position in response to at least one of a signal received from the electronic circuitry or the actuation of the switch.
