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SHUTTLE-COCK PICKER

FIELD OF INVENTION

The present invention here relates to a field of racket games, and more particularly, it is directed to a game of badminton, disclosing a device for retrieving shuttlecocks and storing them appropriately.

BACKGROUND OF THE INVENTION

Badminton is a sport that uses shuttlecocks made of either traditional feather or synthetic-based material, e.g. plastic. It is a sport that can be played both professionally and by amateurs. Like in any other court games, it is inherent in the nature of the game for shuttlecocks to fly off from the court at the end of each round of play. Most of the time, the professional players are adept at picking up the shuttlecocks from the court floor using their own respective badminton rackets, or even from hard to reach areas within the court itself. Unfortunately, not all amateurs are good at picking up the shuttlecocks from the court floor with their own respective badminton rackets. These amateurs will end up bending down to use their hands to pick up the shuttlecocks, a process which can be tiring and inconvenient at times. This process of bending down can be quite disruptive too especially during a training session whereby many shuttlecocks will be used and it increases the chances of picking up more often.

To tackle the problem, there have been some prior art that attempted to alleviate the problem of bending down to retrieve shuttlecocks from a said surface or a badminton court. Some representative examples of such prior art are US 6,652,397, CN 2928158Y and CN 201871188U.

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Lamson's US 6,652,397 patent discloses a smaller mating strip of adhesive mating block and loop fastener which is inter-connected with the mating portion on the sports equipment leaving the adhesive side exposed for picking up the ball or other sports object with that piece of sports equipment. The sports equipment typically can either be a tennis racket, badminton racket, etc. The downside of this invention is that the proposed solution needs to be attached to the racket, be it in tennis or badminton, etc. The adhesive tape will wear off over time and will need replacement, sometimes frequent replacement depending on the usage. Hence this will greatly affect the manner in which the solution will work. Besides, it may affect the game-play since the proposed solution is attached to a certain part of the racket. In addition, the proposed solution does not cater to storing the shuttlecocks after retrieving, especially if there are many shuttlecocks lying around after the badminton training session.

Yi Zhou's CN 2928158Y patent discloses a picking device for shuttlecocks whereby the device comprises of a base, a card holder as well as a ball card, with the card holder attached to the tip portion of the netting portion in a badminton racket. The card holder is made of light-weight plastic materials (or its equivalent materials) in order not to affect the overall weight of the badminton racket. Similarly, the downside for this invention is that the proposed solution needs to be attached to the badminton racket, i.e. not an independent separate solution that can work on its own. Also, there are doubts about its effectiveness since the secure portion of the picking device to the badminton racket may not be strong enough for continual usage. Moreover, the proposed solution does not cater to storing the shuttlecocks after retrieving, especially if there are many shuttlecocks lying around after the badminton training session.

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YiFan's CN 201871188U patent is a utility model that discloses a novel badminton set which can integrate a badminton racket and shuttlecock. It discloses a layer of thin metal plate that is arranged in the cork-head part of the shuttlecock and the bottom of the handle of the badminton racket is provided with a magnet. The user can easily utilise the magnet on the handle of the racket to suck out any shuttlecock, especially when the shuttlecock is hit to a place where it is not so easily reached or pick up by hand. The downside for this invention is that it may not be effective and practical since this requires a layer of thin metal plate on the cork-head part of the shuttlecock, which will affect the weight of the shuttlecock, thus affecting the game-play since the flight of the shuttlecock is affected as well. Similar to the previous prior art, the proposed solution does not cater to storing the shuttlecocks after retrieving, especially if there are many shuttlecocks lying around after the badminton training session.

Hence, the above mentioned prior art has their own limitations, which are namely:

1. All of them require some form of attachments to the racket or the shuttlecock itself, which is obtrusive and may affect game-play;
2. All of them do not have designs that cater to storing shuttlecocks after retrieving from the said surface or badminton court.

The present invention here serves to disclose a device for retrieving the badminton shuttlecock without having the player to bend too much, causing unnecessary strain and tiredness. This device, termed as a shuttlecock picker, should be mobile and portable to carry around. The device disclosed in the present invention is not obtrusive to game-

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play since it is a separate piece of device by itself. The embodiment in the present invention can also cater to store shuttlecocks after retrieving from said surface or badminton court. The device disclosed in the present invention involves having an extendable storage chamber including a lower end for receiving one or more shuttlecocks from a surface and an upper end for retrieving one or more shuttlecocks from the storage chamber. The device also comprises of at least two protruding clips at one end of the chamber. The storage chamber is typically made of plastic or polymer and its related composites and can accommodate standard quantity of at least 12 shuttlecocks or can be extended to accommodate up to a maximum number of shuttlecocks, depending on the design of the shuttlecock picker. Typically, it can cater from 12 to 24 shuttlecocks, both of which are common standard quantity that most shuttlecocks suppliers packed and stored their shuttlecocks. Other than plastic or polymer and its related composites, the storage chamber may also be made of aluminium and its related composites as well as wood laminates. The full extension of the storage chamber allows the player to retrieve the shuttlecock without causing the player to bend too much. Therefore, it is recommended that the player extends the shuttlecock picker to a fully extended position when picking up one or more shuttlecocks from a surface since a fully extended position is long enough for the player to reach out to retrieve the shuttlecocks without bending too much and straining his/her body. Moreover, the storage chamber can either be fully transparent or opaque with a see-through window, both allowing the user to easily see through and count the number of shuttlecocks being retrieved at any one time.

The protruding clips at one end of the storage chamber facilitate the retrieval of the shuttlecock from the surface of floor or a badminton court. For the present invention, the

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protruding clips consist of at least two (2) semi-circular material which are protruding from a circular detachable extension, with the two (2) semi-circular material acting like clips. The material for the two (2) semi-circular protruding clips is typically made of plastic or polymer and its related composites. The two (2) semi-circular material is spaced apart to clip onto the rounded cork-head of the shuttlecock. The spacing between the two (2) semi-circular clips has to be slightly smaller than the diameter of the rounded cork-head of the shuttlecock so that it can clip onto the shuttlecock when the shuttlecock picker device is pressed down onto the tip of the rounded cork head. The semi-circular shape or similar shape in nature (whether elongated or otherwise) facilitates the clipping of the rounded cork-head of the shuttlecock as well as the swivelling process in order to orientate the feathered portion of the shuttlecock to face the ground or a said surface for subsequent ease of entry into the storage chamber. This would also mean that the plastic material for the protruding clips must be of the right flexibility and be able to flex sufficiently in order to facilitate the clipping process.

Moreover, the protruding clips are detachable from the lower end of the storage chamber, mainly for replacement purposes due to wear and tear. After the user has finished retrieving the shuttlecocks from the said surface with the protruding clips attached to the lower end of the storage chamber, a cap that serves as a protective cover will be used to cover over the lower end of the storage chamber (with the protruding clips attached to chamber). This is to prevent any unnecessary dust or foreign particles from flowing into the lower end of the storage chamber as well as to prevent the exposed two protruding clips from accidentally clipping onto any object along the way during transportation. The design of the cap is configured such that it has a nice fitting with the lower end of the storage chamber with the protruding clips attached

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to the chamber. The cap is typically made of plastic or polymer and its related composites. Other suitable materials include aluminium and its related composites as well as wood laminates.

At the other end of the storage chamber, it also comprises of a handle made of plastic material and its related polymer composites. Other suitable materials include aluminium and its related composites as well as wood laminates. Similarly, this handle can be detached from the main storage chamber such that it facilitates the user to retrieve the shuttlecocks from the storage chamber itself when the storage chamber is full or whenever a shuttlecock is needed at any point of time during the badminton game itself. However at this end of the storage chamber, the user would need to remove or pull out the shuttlecock by handling the round shuttlecock head facing the user. For hard to reach shuttlecocks stored deep within the storage chamber, the user can also shake the storage chamber in order to enable the shuttlecock to be dispensed out easily. Moreover, the user can extend the storage chamber with the help of the handle or directly pulling the extension storage chamber outwards so as to accommodate more shuttlecocks as mentioned in the previous paragraphs.

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BRIEF DESCRIPTION OF THE DRAWINGS

The drawings attached here are to aid in better understand the description of the invention here. The drawings are not to scale and they are to be used for merely illustrating the principles and concepts of the invention.

To aid in the description of the invention, the drawings are broken up into the various Figures as described below:

Fig 1 illustrates a perspective view of the embodiment of the present invention, with the storage chamber being extended to accommodate more shuttlecocks.

Fig 2 illustrates a perspective view of the different detachable components of the present invention.

Fig 3a - 3b illustrate a perspective view of the embodiment of the present invention, highlighting the extension and retraction movement of the storage chamber.

Fig 4a illustrates a close-up side view of the two protruding clips in the present invention.

Fig 4b illustrates a close-up side view of the two protruding clips in the present invention with the cap on.

Fig 5a - 5d illustrates the different steps of how the embodiment of the present invention can retrieve shuttlecock.

Fig 6 illustrates a perspective view of the locking mechanism for the embodiment of the present invention.

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Reference numbers

10	Shuttlecock Picker
11	Storage Chamber
11a	Extension Storage Chamber
12	Protruding Clips
13	Detachable Handle
14	Detachable Strap
15	Shuttlecock
16	Coupling Nut
16a	Internal Thread (coupling nut)
16b	External Threads
16c	Recess
17	Fastening Ring
17a	Groove
18	Cap

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DETAILED DESCRIPTION OF PREFERRED EMBODIMENT OF THE PRESENT INVENTION

In the following description, details are provided to describe the embodiment of the application. It shall be apparent to the person skilled in the art, however, that the embodiments may be practiced without such details.

The present invention is a shuttlecock retrieval and storage device that can be modified easily in order to cater to the needs of different users. The device, termed as a “shuttlecock picker” is mobile, light and portable for a user to carry around.

Figure 1 illustrates a side view of the embodiment of the present invention with the device termed as “shuttlecock picker” **10**. When fully extended, the shuttlecock picker **10** consists of storage chamber **11** and extension storage chamber **11a**. The upward extension and downward retraction movement is denoted as **A**. Both the storage chamber **11** and extension storage chamber **11a** are hollow tubes which are cylindrical in shape. The diameter of the storage chamber **11** is bigger than the diameter of the extension storage chamber side **11a** so as to enable the sliding movement for extension and retraction with the help of the detachable handle **13**. This means that the storage chamber **11** has a cylindrical cross-sectional area that is slightly larger than the shuttlecocks to be placed within the storage chamber **11**. This configuration also helps to protect the feathered portion of the shuttlecock **15** from being misaligned during any sliding movement between the storage chamber **11** and the extension storage chamber **11a**. The storage chambers **11** and **11a** are typically made of plastic or polymer and its related composites and can be either totally opaque with a see-through window or fully

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transparent to allow the user to see through easily. Other suitable materials include aluminium and its related composites as well as wood laminates.

In order to adjust and lock the full or partial extension of the two (2) storage chambers **11** and **11a**, a threaded locking mechanism called the coupling nut **16** is being incorporated in-between the storage chambers **11** and **11a**. The coupling nut **16** also aids in preventing the storage chambers **11** and **11a** from moving freely and sliding against each other when the user is using the shuttlecock picker **10**. Details of the locking mechanism will be described in **Figure 6**. As highlighted in **Figure 1**, the shuttlecock picker **10** comes with a detachable two protruding clips **12** at one end of the storage chamber and a detachable handle **13** at the other end of the storage chamber. The protruding clips **12** enable the shuttlecock picker **10** to retrieve or pick up the shuttlecock **15** itself by clipping onto the round cork-head of the shuttlecock **15**. The detachable handle **13** can have many design variations, not just necessary restricted to what was disclosed in the present invention. Other than the main purpose of aiding the user to carry the shuttlecock picker **10** around, the detachable handle **13** also acts like a cover for the top end of the storage chamber **11a**. Also by attaching back the protruding clips **12** at the lower end of the storage chamber **11**, a cap (i.e. shown in **Figure 2** and **Figure 4b**) can then be used to cover the lower end of the storage chamber **11**, with the design of the cap being configured such that it has a nice fitting with the lower end of the storage chamber **11** with the protruding clips **12** attached to the chamber. Also, a strap **14** can be attached to the exterior of the storage chamber **11** to facilitate the user to carry around or back-sling on the back of the body of the user. Similarly, the strap **14** is detachable and can be removed if necessary.

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Figure 2 illustrates a perspective view of the different detachable components in the present invention. As illustrated, the detachable handle **13** and the two protruding clips **12** can be detached from both ends of the storage chambers **11a** and **11** respectively. At the lower end of the storage chamber **11**, the detachable two protruding clips **12** can be attached to the storage chamber **11**. As mentioned earlier in **Figure 1**, a detachable cap **18** can be used to cover the lower end of the storage chamber **11** with the two protruding clips **12** affixed to the storage chamber **11**.

Figure 2 also illustrates the detachable portion of the threaded locking mechanism consisting of the coupling nut **16** and the fastening ring **17**. The threaded locking mechanism is for locking the storage chamber **11** and the extension storage chamber **11a**, as well as to facilitate the extension and retraction of the two (2) storage chambers. The coupling nut **16** is slid over extension storage chamber **11a**. The fastening ring **17** provides a good fit with the lower end of the storage chamber **11a**. The external diameter of the fastening ring **17** is larger than the internal diameter of the coupling nut **16**. Hence the fastening ring **17** will act like a stopper to prevent the coupling nut **16** from sliding out prior to assemble together with the upper end of the storage chamber **11**. The upper end of the storage chamber **11** can then be fastened over the coupling nut **16**. Such a configuration enables the extension storage chamber **11a** and storage chamber **11** to extend or retract by sliding against each other, with the coupling nut **16** providing the necessary fastening and locking of the two storage chambers **11** and **11a** at any point along the entire length of the shuttlecock picker **10**. Details of the accompanying description for the locking mechanism are provided in **Figure 6**.

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Figure 3a illustrates how the extension storage chamber **11a** can be extended or retracted back, with the upward and downward motion denoted as **A**. By turning the coupling nut **16** either clockwise or anti-clockwise denoted as **B**, the extension storage chamber **11a** can either slide out or collapse back to position, which can be illustrated in **Figure 3b**. To extend the extension storage chamber **11a**, the coupling nut **16** would need to be loosen by turning it in a anti-clockwise direction, followed by having the user to slide out the extension storage chamber **11a**, either by manually sliding it out with the hands on the extension storage chamber **11a** itself or via the use of the handle **13**. The extension storage chamber **11a** can either be partially extended or fully extended. Once the desired extension length is reached, the user would then need to tighten or fasten the coupling nut **16** by turning in a clockwise direction so as to prevent the extension storage chamber **11a** from sliding in and out with the storage chamber **11** during normal usage and handling. Similarly, the reverse of the above-mentioned process applies if the user wants to have the extension storage chamber **11a** to collapse back to position, i.e. fully retracted back.

Figure 4a and **4b** illustrates a close-up side view of the two protruding clips **12** with one end of the storage chamber **11**. The two protruding clips **12** is molded as one (1) complete piece consisting of two (2) semi-circular plastic or polymer-related composite material which are protruding from a circular detachable extension, acting like clips which are spaced apart to clip onto the rounded cork-head of the shuttlecock **15**. The plastic chosen has to be flexible and strong enough to be able to withstand the constant flexing and stress as well as to be able to clip onto the cork-head of the shuttlecock **15**. In order for the two protruding clips **12** to be able to clip and hold onto the cork-head of the shuttlecock **15**, the inner diameter of the two (2) clips denoted by numeral **12a** will be

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slightly smaller than the exterior diameter of the cork-head of the shuttlecock. In addition, the semi-circular shape or other similar shape (whether elongated or otherwise) mentioned in the present invention facilitates the gripping of the cork-head of the shuttlecock **15** after a force has been applied downwards to the shuttlecock picker **10** with the two protruding clips **12** making contact with the cork-head of the shuttlecock **15**. Besides the semi-circular shape or other similar shape (whether elongated or otherwise) aids in the swivelling process in order to orientate the feathered portion of the shuttlecock to face the ground or a said surface for subsequent ease of entry into the storage chamber. An illustration and its accompanying details are mentioned in **Figure 5a – 5d**.

In addition, **Figure 4b** also illustrates how the present embodiment in the present invention will look like when a cap **18** is being used to totally encase the lower end of the storage chamber **11** with the two protruding clips **12** affixed to storage chamber **11**, in which the clips are hidden inside the cap **18**.

Figure 5a to 5d illustrates the different steps of how the embodiment of the present invention can retrieve shuttlecock **15**. At any one time, only one (1) shuttlecock **15** would be able to be retrieved using the shuttlecock picker **10**. The different steps highlighted in **Figure 5a to 5d** would need to be repeated if one were to retrieve more than one shuttlecock at any one time. In **Figure 5a**, the two protruding clips **12** would need to be positioned around the cork-head of the shuttlecock **15**. Next as illustrated in **Figure 5b**, a downward motion denoted as **C** would have to be applied so as to force the two protruding clips **12** onto the cork-head of the shuttlecock **15** so that the shuttlecock **15** is clipped onto the two protruding clips **12**. Subsequently as shown in **Figure 5c**, the

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storage chamber **11** would need to be lifted up via an upward motion denoted as **D** so that the shuttlecock **15** swivels into place with the feathered portion of the shuttlecock **15** facing downwards. Lastly as shown in **Figure 5d**, a downward force **E** would have to be applied in order to force the shuttlecock **15** into the storage chamber **11** for proper storage and subsequent retrieval. As mentioned earlier, the whole process mentioned in **Figure 5a to 5d** would need to be repeated if one were to collect more than one (1) shuttlecock at any one time. The process can be stopped if the shuttlecock picker **10** has already reached the maximum number of shuttlecocks.

Figure 6 highlights a perspective view of the locking mechanism for the embodiment of the present invention. The locking mechanism which consists of a coupling nut **16** together with the fastening ring **17**, aids in fastening and securing the extension storage chambers **11a** and storage chamber **11** at any point along the entire length of the shuttlecock picker **10**. Moreover the locking mechanism prevents the storage chambers **11** and **11a** from moving freely and sliding against each other during normal usage and handling. During assembly, the coupling nut **16** is slid over the extension storage chamber **11a** (either from the top or bottom end), with the internal portion of the coupling nut **16** being threaded as shown in numeral **16a**. The fastening ring **17** is being clipped onto the lower end of the extension storage chamber **11a** via the groove **17a** which provides a good fit. A recess **16c** at the upper end of the storage chamber **11** enables the fastening ring **17** to sit nicely when the coupling nut **16** is being fastened to lock the two (2) storage chambers **11** and **11a**, with the threaded portion **16a** making contact with the external threads **16b** on the upper end of storage chamber **11**. Due to the differences in the diameter of the fastening ring **17** with the coupling nut **16**, the fastening ring **17** will act like a stopper to prevent the coupling nut **16** from sliding out

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prior to assemble together with the upper end of the storage chamber **11**. The locking mechanism also enables the shuttlecock picker **10** to be fully extended to accommodate the maximum number of shuttlecocks being stored within extension storage chambers **11a** and storage chamber **11**.

While what has been described hereinabove is the preferred embodiment of the invention, those skilled in the art will understand that numerous modifications may be made without departing from the spirit and scope of the invention. For example, synthetic shuttlecocks other than feathered shuttlecocks may also be retrieved and picked up using the present invention. The embodiments described herein are meant to be illustrative only and should not be taken as limiting the invention, which can be expressly set forth in the following claims.

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CLAIMS

What is claimed is:

1. A shuttlecock retrieval and storage device, comprising of:
 - a storage chamber wherein it consists of
 - a top storage chamber and
 - a bottom storage chamber;wherein the lower end of the top storage chamber is able to slide in and out with the upper end of the bottom storage chamber; and
 - a locking mechanism for locking the top and the bottom storage chamber when they are extended or retracted as well as to prevent the storage chambers from moving against each other during normal handling and usage; and
 - a detachable clip-like body that can be attached to the lower end of the bottom storage chamber, with the said detachable clip-like body comprising of at least two or more protruding clips with a semi-circular shape that is flexible enough to be able to clip onto the cork-head portion of a shuttlecock; and
 - a detachable cap-like body that can be attached to the lower end of the storage chamber to cover the two detachable clips attached to the lower end of the bottom storage chamber; and
 - a detachable handle-like body that can be attached to the upper end of the storage chamber for ease of carrying and handling as well as to cover the upper end of the top storage chamber.

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2. The device of **claim 1**, wherein the top storage chamber is cylindrical and has a first diameter, the bottom storage chamber is cylindrical and has a second diameter, and wherein the second diameter is larger than the first diameter so that the top storage chamber is able to slide in and out of the bottom storage chamber at any extended or retracted position without damaging the feathered portion of the shuttlecocks.
3. The device of **claim 1**, wherein the top and bottom storage chambers can be fully opaque with a see-through window or fully transparent.
4. The device of **claim 1**, wherein the locking mechanism comprises of a fastening ring and an internally threaded coupling nut, wherein the fastening ring and the coupling nut work together to enable either the top or bottom storage chamber to slide against each other in order to adjust the overall length of the shuttlecock picker device, and not to slide freely against each other during normal usage and handling.
5. The device of **claim 1**, wherein the locking mechanism comprises of a fastening ring and an internally threaded coupling nut, wherein the fastening ring and the coupling nut work together to enable either the top or bottom storage chamber to slide against each other without damaging the feathered portion of the shuttlecock.

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6. The device of **claim 1**, wherein the width between the two protruding clips is slightly smaller than the external diameter of the cork-head portion of the shuttlecock, such that it facilitates the clipping of the shuttlecock when the shuttlecock picker device is pressed down onto the tip of the rounded cork-head.
7. The device of **claim 1**, wherein the shape of the protruding clips must be at least semi-circular or of similar shape (whether elongated or otherwise) in order to facilitate gripping of the cork-head of the shuttlecock to ease the entry of the shuttlecock into the storage chamber.
8. The device of **claim 1**, wherein a strap can be attached to the external portion of the said storage chamber and is said to be detachable.
9. The device of **claim 1**, wherein the said material for two or more protruding clips with a semi-circular shape is made of plastic or its related polymer composites.
10. The device of **claim 1**, where the top and bottom storage chambers, the locking mechanism, the detachable cap-like body for the lower end of the storage chamber and the detachable handle-like body is made of one of the following materials, i.e. plastic or its related composites or aluminium and its related composites or wood laminates.