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(54) **COLLAPSIBLE STORAGE DEVICE**

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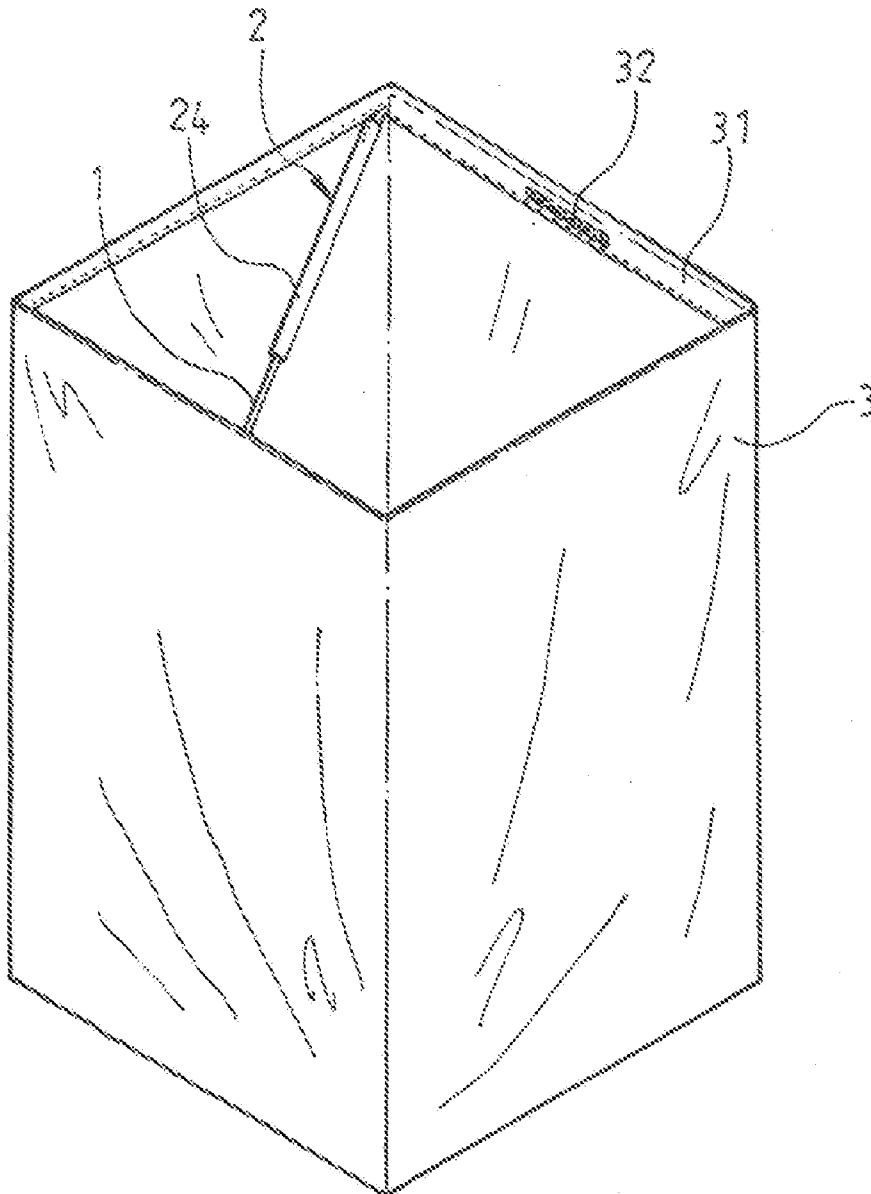
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(57) **ABSTRACT**

The storage device contains two U-shaped lower frame elements, two inverse U-shaped upper frame elements, a casing member, and some resilient element. The lower frame elements are hinged such that they can be closed towards or expanded away from each other. The two upper frame elements have their fork legs jointed to the fork arms of the lower frame elements, respectively. The engagement of the fork legs and arms is buffered by the resilient elements which are provided inside the fork legs, respectively.

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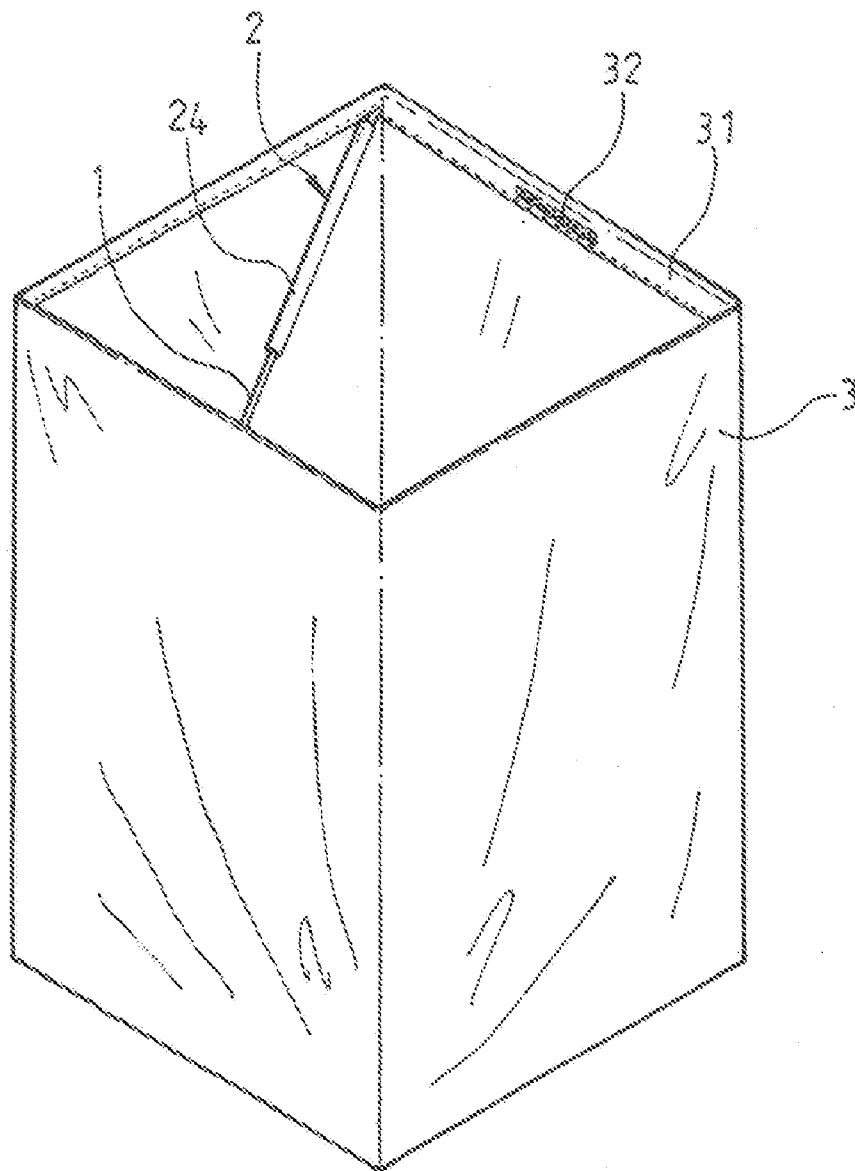


FIG. 1

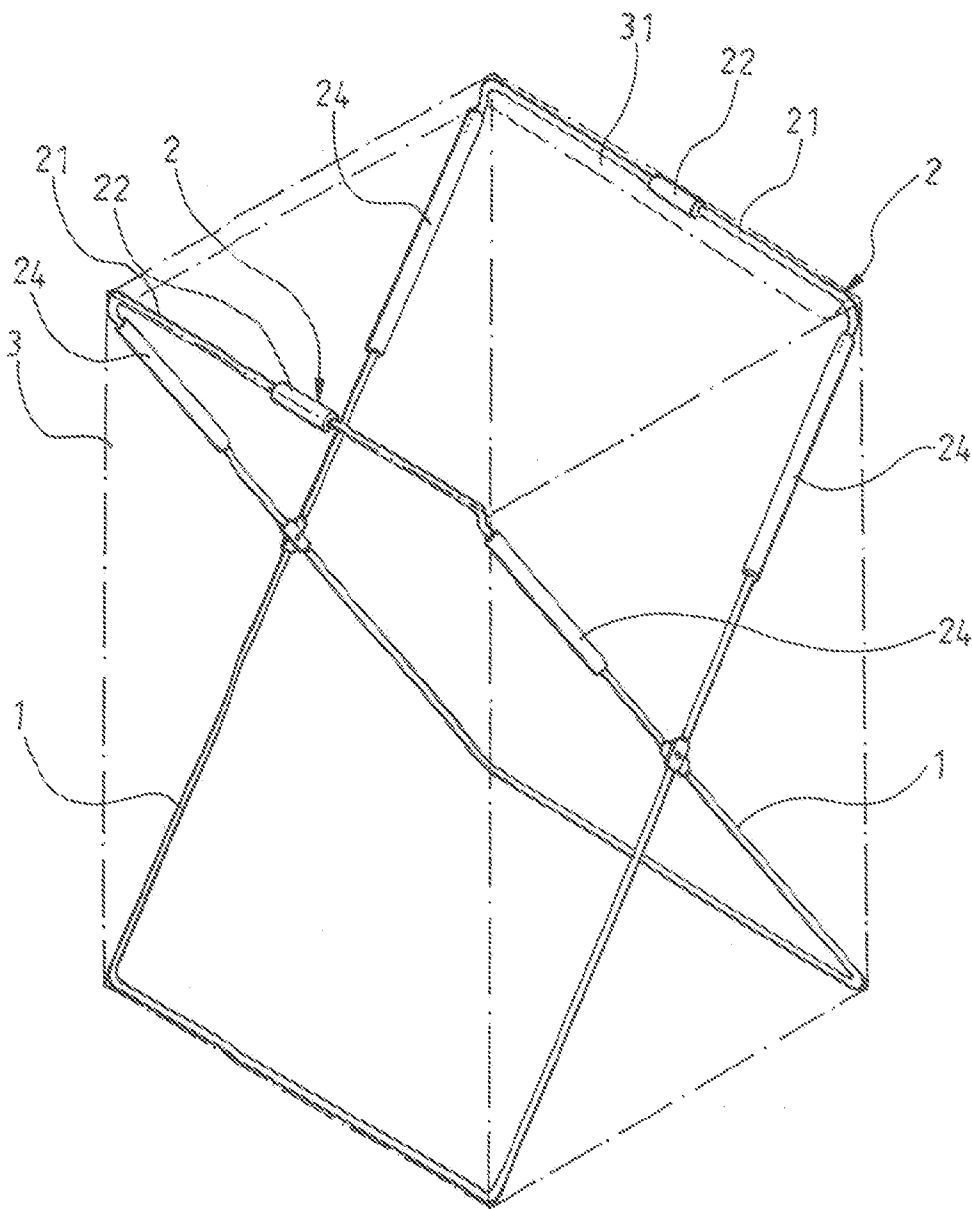


FIG. 2

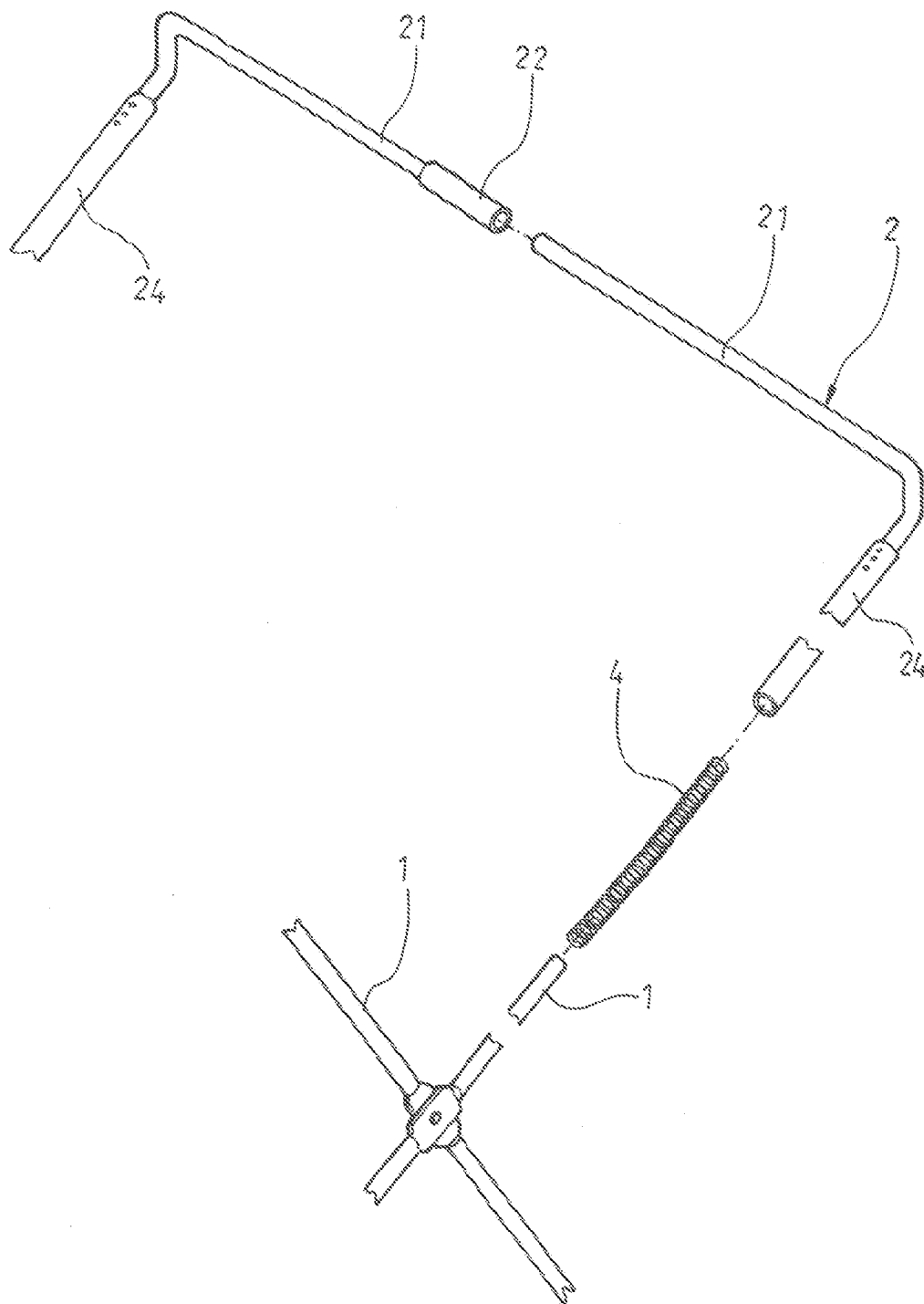


FIG. 3

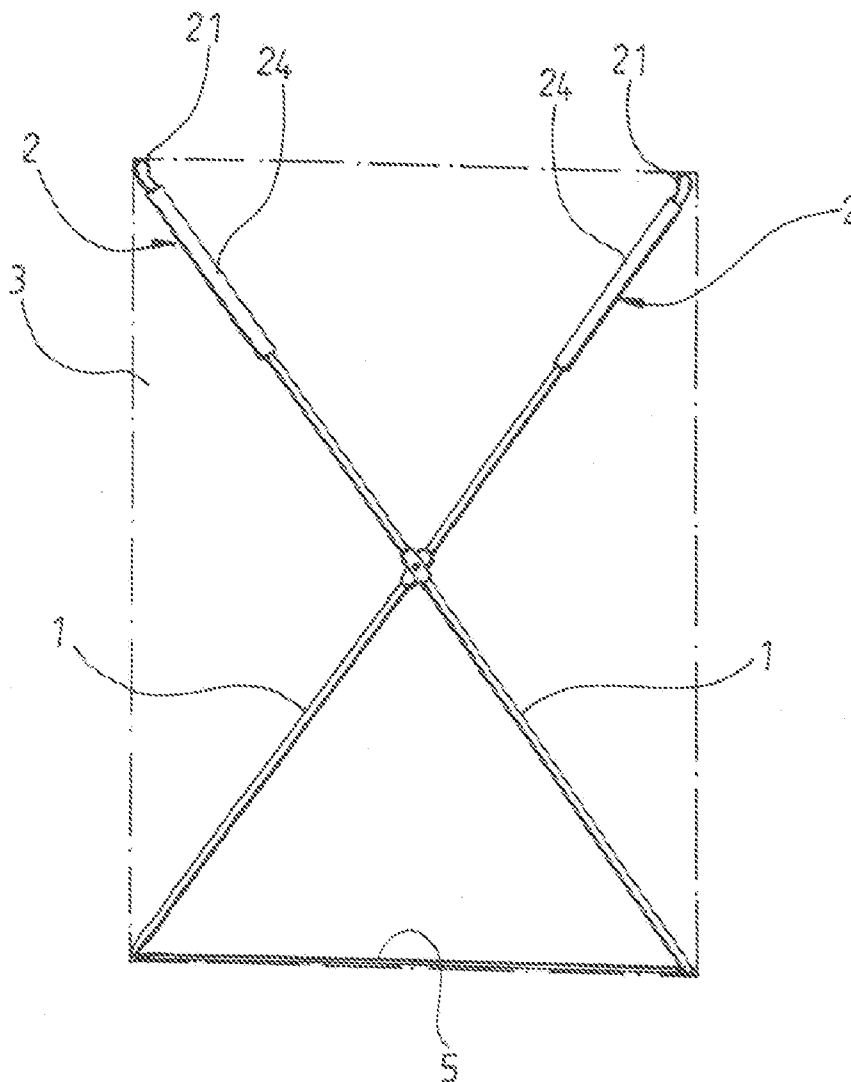


FIG. 4

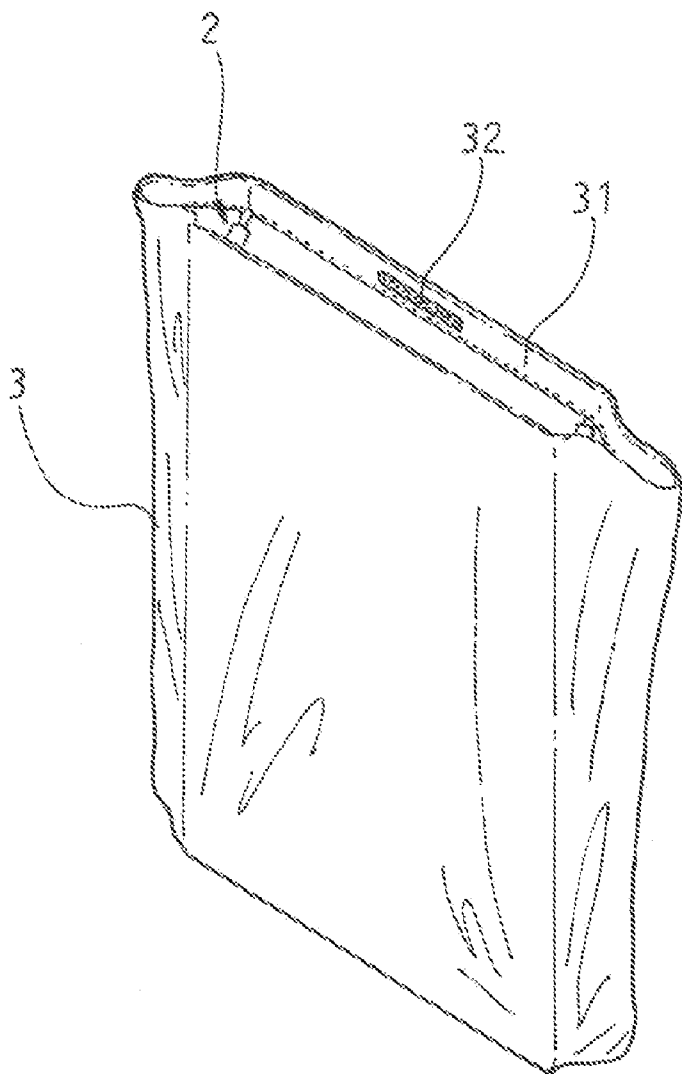


FIG. 5

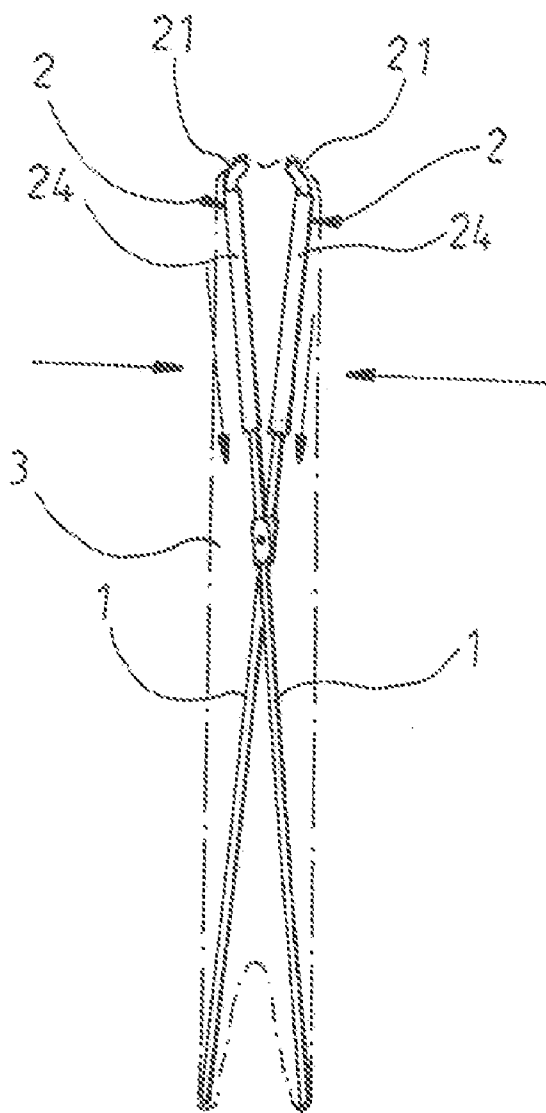


FIG. 6

COLLAPSIBLE STORAGE DEVICE

(a) TECHNICAL FIELD OF THE INVENTION

[0001] The present invention generally relates to storage devices, and more particularly to a storage device that can be collapsed into a flat object for easier carry and storage when not in use.

(b) DESCRIPTION OF THE PRIOR ART

[0002] A storage box usually has a rigid form such that, even when it is not in use and empty, it still takes up some space. Therefore, some assembly-type or collapsible storage boxes or devices are developed. However, these collapsible storage devices usually contain quite some parts and are structured rather complicated. Most of the time, a novice user has to spend significant amount of effort and time to get the device assembled and disassembled.

SUMMARY OF THE INVENTION

[0003] The primary purpose of the present invention is to provide a novel collapsible storage device, which when not in use, can be collapsed into a flat object for easier carry and storage.

[0004] The storage device contains two U-shaped lower frame elements, two inverse U-shaped upper frame elements, a casing member, and some resilient element. The fork arms of one lower frame element are hinged to the fork arms of the other lower frame element, respectively, such that the two lower frame elements can be closed towards or expanded away from each other. The two upper frame elements have their fork legs jointed to the fork arms of the lower frame elements, respectively. The engagement of the fork legs and arms is buffered by the resilient elements which are provided inside the fork legs, respectively.

[0005] To assemble the storage device, the assembled frame structure is placed inside the casing member and the two lower frame elements (along with the upper frame elements) are expanded to brace the casing member. To disassemble the storage device, the storage device is compressed laterally from two opposing sides towards each other. As the casing member collapses and the two lower frame elements close to each other, the resilient elements allows the fork arms to sink deeper into the fork legs so that the storage device is turned completely into a flat object.

[0006] The foregoing object and summary provide only a brief introduction to the present invention. To fully appreciate these and other objects of the present invention as well as the invention itself, all of which will become apparent to those skilled in the art, the following detailed description of the invention and the claims should be read in conjunction with the accompanying drawings. Throughout the specification and drawings identical reference numerals refer to identical or similar parts.

[0007] Many other advantages and features of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which a preferred structural

embodiment incorporating the principles of the present invention is shown by way of illustrative example.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a perspective schematic view showing the storage device according to an embodiment of the present invention when the storage device is assembled.

[0009] FIG. 2 is a perspective schematic view showing the frame structure inside the storage device of FIG. 1.

[0010] FIG. 3 is a perspective schematic view showing the assembly of the upper and lower frame elements of FIG. 1.

[0011] FIG. 4 is a sectional schematic view showing the frame structure of FIG. 1.

[0012] FIG. 5 is a perspective schematic view showing the storage device of FIG. 1 when it is completely collapsed.

[0013] FIG. 6 is a sectional schematic view showing the frame structure of FIG. 1 when the storage device is collapsed.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] The following descriptions are exemplary embodiments only, and are not intended to limit the scope, applicability or configuration of the invention in any way. Rather, the following description provides a convenient illustration for implementing exemplary embodiments of the invention. Various changes to be described embodiments may be made in the function and arrangement of the elements described without departing from the scope of the invention as set forth in the appended claims.

[0015] As shown in FIGS. 1 to 3, the storage device according to an embodiment of the present invention mainly contains two U-shaped lower frame elements 1, two inverse U-shaped upper frame elements 2, a casing member 3, and a number of resilient elements 4. The two lower frame elements 1 are arranged such that their two fork arms are pointed upwards and the bottom beams are on the ground. Furthermore, the fork arms of one lower frame element 1 are hinged to the fork arms of the other lower frame element 1, respectively, such that the two lower frame elements 1 can be closed towards or expanded away from each other.

[0016] Each upper frame element 2 contains two parts, each containing a portion of the top beam 21 and one of the fork legs 23. The two parts are joined together by a first sleeve 22 which is fixedly configured on one of the parts. Each leg 23 has a second sleeve 24 at the lower end and, at the upper end, the leg 23 is bended vertically upward to meet with the top beam 21. The resilient elements 4 (such as a helix spring) are provided inside the second sleeves 24, respectively.

[0017] The casing member 3, having a box shape, is made of cloth or other soft material. Two horizontal pockets 31 are provided on the inside of the casing member 3 end to end along two opposing top edges, respectively. Two fastening elements 32 (such as a hook and loop fastener) are affixed on the outside of the two pockets 31 at corresponding locations.

[0018] To assemble the storage device, the two parts of an upper frame element 2 have their portions of the top beam 21 inserted into a pocket 31 from the pocket 31's two end openings, respectively. The two parts are then joined together to tightening the first sleeve 22 inside the pockets 31. Subsequently, the two upper frame elements 2 have their fork legs 23 jointed to the fork arms of the lower frame elements 1, respectively. Then, the two lower frame elements 1 (along

with the upper frame elements 2) are expanded to brace the casing member 3. As shown in FIG. 4, a bottom board 5 can be placed inside the expanded casing member 3 at the bottom to support the objects stored inside.

[0019] To disassemble the storage device, the bottom board 5 is first removed. Then, as shown in FIGS. 5 and 6, the storage device is compressed laterally from two opposing sides towards each other. As the casing member 3 collapses and the two lower frame elements 1 close to each other, the resilient elements 4 allow the fork arms of the lower frame element 1 to sink deeper into the second sleeves 24. As the storage device is turned completely into a flat object, the fastening elements 32 are attached to each other to tightly hold the storage device in its collapsed form. As such, the collapsed storage device can be easily carried and stored, without taking up much space.

[0020] It will be understood that each of the elements described above, or two or more together may also find a useful application in other types of methods differing from the type described above.

[0021] While certain novel features of this invention have been shown and described and are pointed out in the annexed claim, it is not intended to be limited to the details above, since it will be understood that various omissions, modification, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing in any way from the spirit of the present invention.

I claim:

- 1. A collapsible storage device comprising:
 - a plurality of resilient elements;
 - two inverse U-shaped upper frame elements wherein each of the fork legs has a second sleeve at the end that houses a resilient element inside;
 - two U-shaped lower frame elements wherein the fork arms of one lower frame element are hinged to the fork arms of the other lower frame element, respectively, such that said lower frame elements are capable of being closed towards or expanded away from each other, and said upper frame elements are joined to the said lower frame elements, respectively, by having the fork arms sleeved inside said second sleeves of said upper frame elements, respectively;
 - a box-shaped casing member housing and braced by said assembled upper and lower frame elements;
- 2. The collapsible storage device according to claim 1, wherein each of said upper frame element contains two parts, each containing a portion of the top beam of said upper frame element and one of the fork legs; and the two parts are joined together by a first sleeve which is fixedly configured on one of said parts.
- 3. The collapsible storage device according to claim 1, wherein said casing member is made of cloth or other soft material.

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