

STORAGE DEVICE FOR SHOES

Field of the Invention

The present invention relates to a storage device for shoes. In particular, the invention relates (but is not limited to) a storage device for use in confined
5 spaces and will be described in this context.

Background Art

Throughout the specification, unless the context requires otherwise, the word “comprise” or variations such as “comprises” or “comprising”, will be understood to imply the inclusion of a stated integer or group of integers but
10 not the exclusion of any other integer or group of integers.

Furthermore, throughout the specification, unless the context requires otherwise, the word “include” or variations such as “includes” or “including”, will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

15 In the description, the terms ‘shoe’, ‘shoe wear’, ‘foot wear’ and their plural form may be used interchangeably.

The following discussion of the background to the invention is intended to facilitate an understanding of the present invention only. It should be appreciated that the discussion is not an acknowledgement or admission that
20 any of the material referred to was published, known or part of the common general knowledge of the person skilled in the art in any jurisdiction as at the priority date of the invention.

Shoe storage devices typically exist in the form of shelves or cabinets, where each shelf may hold a number of shoes. Such storage devices are often
25 bulky and may take up a lot of space. In particular, vertical space is often wasted because shoes are of different sizes and the height between shelving units will need to account for the shoe wear of the largest height (such as a pair of boots). In addition, the allocation of space is often not effective as some shelves or cabinets may be under-utilized.

To mitigate the above, there currently exist shoe storage devices for use in confined space. These shoe storage devices typically comprises multi-tiered shelves arranged to be rotatable about a central pivot shaft. The shelves are typically circular and each of such multi-tiered shelves may hold multiple pairs of shoes. To retrieve his shoes, a user rotates a shelf unit about its centre until he locates his shoes in the nature of a 'Lazy Susan' manner. In more advanced designs, the 'rotatable shoe rack' arrangement may be mounted within cabinets and the length of the central pivot shaft made adjustable so as to fit in between cabinets of different sizes. The adjustable length of the central pivot also allows mounting from ceiling to floor in houses.

There are a few disadvantages associated with the above arrangement.

Firstly, clearance and space has to be made for the circular shaped shelves in order for a user to have enough space to rotate and turn a shelf to take the shoes. Secondly, the adjustment of the height between each shelf unit has to be based on the shoe wear with the highest height to be positioned between the shelves. Thirdly, the overall space utilization is the same whether the shoes are stowed for storage or retrieved for use.

There exists a need for an improved shoe storage device to mitigate at least one of the above-mentioned problems.

Disclosure of the Invention

In accordance with an aspect of the present invention, there is provided a storage device for shoes comprising a shaft; a plurality of trays, each tray dimensioned to receive a pair of foot wear and rotatably mounted on the shaft such that each of the plurality of trays are rotatable about the shaft between a first open position where the pair of shoes is made accessible for retrieval and a second stowed position where the shoes are stowed; wherein space utilization of the storage device is minimized when all the trays are in the second stowed position.

Preferably the at least one tray of the plurality of trays comprises a support structure.

Preferably, the support structure comprises two ridges positioned across the diagonals of the tray.

Preferably, the support structure comprises a plurality of oval-shaped ridges.

Preferably, each tray is substantially rectangular in shape and comprises a
5 base and two walls forming a partially enclosed area for positioning a pair of shoes. More preferably the interior angle between the base and at least one wall is less than 90 degrees.

Preferably, the height between one tray and another tray mounted on the shaft is adjustable.

10 In accordance with a second aspect of the invention there is a tray for use with a storage device the first aspect, the tray comprising a base for receiving the pair of foot wear and two walls forming a partially enclosed area for positioning a pair of shoes; a collar for mounting onto the shaft, and a support structure for reinforcing the weight bearing properties of the base.

15 **Brief Description of the Drawings**

The present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 shows a perspective view of the shoe storage device in accordance with an embodiment of the invention;

20 Fig. 2a shows the shaft of the shoe storage device in accordance with an embodiment of the invention;

Fig. 3a and 3b shows the tray in accordance with an embodiment of the invention;

Fig. 3c shows a side view of a tray mounted onto the shaft in accordance with
25 an embodiment of the invention;

Fig. 3d shows the underside of the tray with support structure in accordance with another embodiment of the invention;

Fig. 4 is the perspective views of possible reinforcing brackets for use with the collar of the tray in accordance with an embodiment of the invention;

Fig. 5 shows various views of the height divider in accordance with an embodiment of the invention;

- 5 Fig. 6 shows the perspective and side view of an end cap in accordance with an embodiment of the invention;

Fig. 7 shows the shoe storage device having trays in a stowed position within a cabinet; and

- 10 Fig. 8 shows the shoe storage device having tray(s) in an opened position within a cabinet where a user can access a pair of shoes.

Other arrangements of the invention are possible and, consequently, the accompanying drawings are not to be understood as superseding the generality of the description of the invention.

Description of Embodiments of the Invention

- 15 In accordance with an embodiment of the invention and with reference to Fig. 1 there is a storage device 10 for shoes comprising a shaft 12 and a plurality of trays 14 rotatably mounted on the shaft 12 such that the trays 14 are rotatable between a first and second position. Each tray 14 is suitable for holding a pair of shoes. The first position corresponds to an opened position
20 where the shoes on the trays 14 are made accessible for a user to retrieve his shoes. The second position corresponds to a stowed position for storage.

- It is to be appreciated that the terms 'first position' and 'second position' are used for illustration purpose only. The terms may be interchangeable, i.e. the first position may correspond to a closed position and the second position may
25 correspond to an opened position.

The shaft 12 is a circular hollow shaft and has an outer diameter of about 25 millimetres (mm). The shaft is made of aluminium. The thickness of the shaft 12 is 1.2 to 1.5 mm.

Each tray 14 comprises a base 16 having dimensions for holding a pair of footwear, the dimensions allowing the footwear to be positioned side by side each other. Base 16 is substantially rectangular but comprises rounded edges.

- 5 Extending from the base 16 is a first extension 20 along the length of the base 16, and a second extension 22 along the breadth of the base 16. The first and second extensions 20, 22 extend from the base 16 to a height h_1 , h_2 . First and second extensions 20, 22 function as side walls to prevent the shoes (when present) on the tray 14 from falling off during movement/rotation. The
10 extensions 20, 22 may be integrally moulded with the tray 14. The tray 14 is formed using Acrylonitrile butadiene styrene (ABS) plastics. When formed, the interior angle between base 16 and the first and second extension is slightly less than 90 degrees (see Fig. 3c) so that when a pair of shoes is placed on the tray 14, the shoes may be retained in position without slipping
15 off easily (see Fig. 3c).

A portion 20a of the first extension 20 may protrude from the length of the base 16 to function as a handle when a user rotates the tray 14.

- Each tray 14 is preferably dimensioned having a length of about 286mm, a breadth of about 222mm and a height h_1 of 65mm. The height h_2 is typically
20 lower than height h_1 .

At one end of the first extension 20 corresponding to an edge of the tray 14 there is formed a collar 24 for mounting the tray 14 onto the shaft 12.

- The collar 24 has a diameter slightly greater than the outer diameter of the shaft 12 (around 28 mm) so that the collar 24 could be slidably mounted on
25 the shaft 14. Alternatively, the collar 24 could also be snap-fitted onto the shaft 12.

- As the tray 14 is mounted via an edge onto the shaft 12, when a pair of shoes is placed on it, the end of the tray 14 furthest away of the shaft 12 tends to bend under the weight of the shoes. Although the formation of the tray 14
30 tilted with respect to the horizontal as described above does account for the bending to some extent, to further mitigate the effects of the weight of heavy

shoe wear (example boots), the underside of the tray 14 may be reinforced by a support structure 30.

An example of the support structure 30 comprises two flanges 32 positioned across the diagonals underside of the tray 14, the two diagonals forming a cross. Additional support structure 30 may be in the form of oval-shaped ridges 34.

The shoe storage device 10 further comprises height dividers 40 arranged to be positioned between each tray 14 for height adjustment. The height divider 40 is similar in structure as the collar 24 and may be slidably mounted onto the shaft 12 or snap-fitted onto the shaft 12. Each height divider 40 is of a predetermined length p . The height between each tray 14 may be adjusted by arranging a plurality of height dividers 40 one above another. For example, three height dividers 40 form a height of $3p$; four height dividers 40 form a height of $4p$ and so on.

For fastening the shaft 12 onto a surface, such as the top/bottom of a cabinet, or the ceiling/floor of a room, the shoe storage device 10 comprises end cap 50. End cap 50 comprises a protrusion 52 and a flat base 54. The protrusions 52 are inserted into the hollow portion of the shaft 12. The flat base 54 may comprises holes for fastening on a surface using fasteners such as screws.

The storage device 10 is assembled depending on a user preference on the number of trays 14, the height ($h+p$, $h+2p$, $h+3p$ etc.) between each tray 14.

With reference to figures Fig. 7 and Fig. 8, the shoe storage device 10 will next be described in the context of its operation.

A user has a pair of boots, a pair of slippers and a pair of working shoes or sport shoes. He places the pair of boots on the tray 14 where the height between the tray 14 and the adjacent tray 14 is $h+3p$. The pair of slippers is placed on another tray 14 having a height of h only (without need for height divider); and the working shoes may be placed on a tray 14 having a height of $h+p$. Fig. 7 shows the shoe wear in a stowed position.

When a user wishes to retrieve a pair of shoes (for example the boots), he rotates the tray 14 outwardly towards himself (see Fig. 8), the rotation pivoted about the shaft 12. For storage the user just places the shoe on the designated tray 14 and rotates the pair of shoes back in position as shown in
5 Fig. 7.

In another embodiment, the length of the shaft 12 of the storage device 10 is made adjustable using telescopic extensions.

In another embodiment, reinforcing brackets 26 may be used in conjunction with the collar 24. Reinforcing brackets 26 are used where the diameter of the
10 shaft 12 is smaller than expected and are positioned to prevent the mounted tray 14 from unnecessary shaking and jerking.

The above described embodiments are advantageous over the prior art in at least the following ways:-

- a. The space utilization of the storage device 10 when all the trays 14 are
15 stowed away is much lesser than when a tray 14 is rotated to the opened position for retrieval of shoes.
- b. The height between each tray 14 is adjustable based on user preference and the type of shoe wear required to be placed on each tray 14.
- c. The parts 12, 14, 24 are modular and individual parts may be replaceable
20 without the need to replace the whole storage device 10.
- d. The modular nature of the storage device 10 and its constituent components also makes it slim and easy to install. In particular, the fact that each tray 14 is dimensioned to fit a pair of shoes reduces the overall form factor of the storage device 10.
- 25 e. The 'rotate/flip to open' is more convenient than the 'lazy susan' method of retrieving shoes. In particular, the 'flip to open' allows a user much more clearance space to retrieve his shoes in the open position.

It should be appreciated by the person skilled in the art that the above invention is not limited to the embodiments described. In particular, the

following modifications and improvements may be made without departing from the scope of the present invention:

- The shape of the trays 14 may be modified and changed as known by a skilled person in the art as long as one tray 14 is dimensioned to hold one pair of shoes;
- The dimensions of the shaft 12, tray 14, collar 24, height divider 40. are provided by way of examples only. The dimensions may be scaled up or down in accordance with the preference of the user as long as it does not hinder the overall functionality of the invention. In particular, the height divider 40 may have a length p of 25 mm or 50 mm.

It should be further appreciated by the person skilled in the art that variations and combinations of features described above, not being alternatives or substitutes, may be combined to form yet further embodiments falling within the intended scope of the invention.

The Claims Defining the Invention are as Follows

1. A storage device for shoes comprising
a shaft;
a plurality of trays, each tray dimensioned to receive a pair of foot wear
5 and rotatably mounted on the shaft such that each of the plurality of
trays are rotatable about the shaft between a first open position where
the pair of shoes is made accessible for retrieval and a second stowed
position where the shoes are stowed;
wherein space utilization of the storage device is minimized when all the
10 trays are in the second stowed position.
2. A storage device according to claim 1, wherein at least one tray of the
plurality of trays comprises a support structure.
3. A storage device according to claim 2, wherein the support structure
comprises two ridges positioned across the diagonals of the tray.
- 15 4. A storage device according to claims 2 or 3, wherein the support
structure comprises a plurality of oval-shaped ridges.
5. A storage device according to any one of the preceding claims, wherein
each tray is substantially rectangular in shape and comprises a base and
two walls forming a partially enclosed area for positioning a pair of
20 shoes.
6. A storage device according to claim 5, wherein the interior angle
between the base and at least one wall is less than 90 degrees.
7. A storage device according to any one of the preceding claims, wherein
height between one tray and another tray mounted on the shaft is
25 adjustable.
8. A tray for use with a storage device of claim 1, the tray comprising a
base for receiving the pair of foot wear and two walls forming a partially
enclosed area for positioning a pair of shoes; a collar for mounting onto

the shaft, and a support structure for reinforcing the weight bearing properties of the base.