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(56) Documents Cited:
CN 209677910 U
CN 205053418 U
CN 203802062 U
CN 201085317 Y
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US 6145931 A
US 5137240 A
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CN 204519965 U
CN 202589224 U
CN 107183986 A
JP 2002085196 A
US 5967255 A
US 4087127 A

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INT CL **A47C, A47G, A47K**
Other: **Espacenet, Derwent World Patents Index (DWPI)**

(54) Title of the Invention: **Collapsible apparatus for putting footwear on feet**
Abstract Title: **Collapsible apparatus for putting footwear on feet**

(57) The present invention relates to a collapsible apparatus for putting footwear on feet (100) that comprises a main structure (200) to which a seat (300) and a support (400) are pivotingly fastened structurally and rotationally interdependently and that, in conjunction with a horizontal substrate (SH), form three preferably parallel levels (N300, N400, NSH) of different heights.

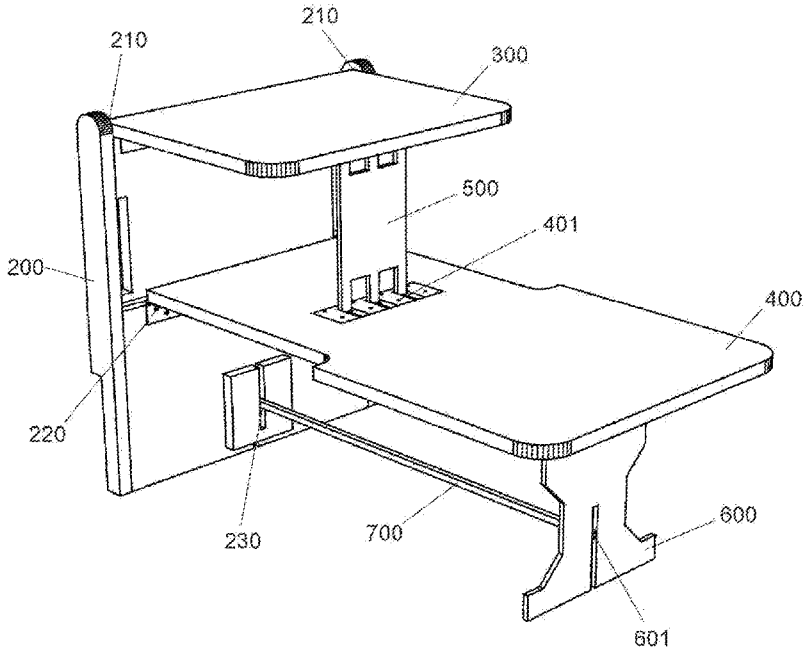


Fig. 1

GB 2612263 A

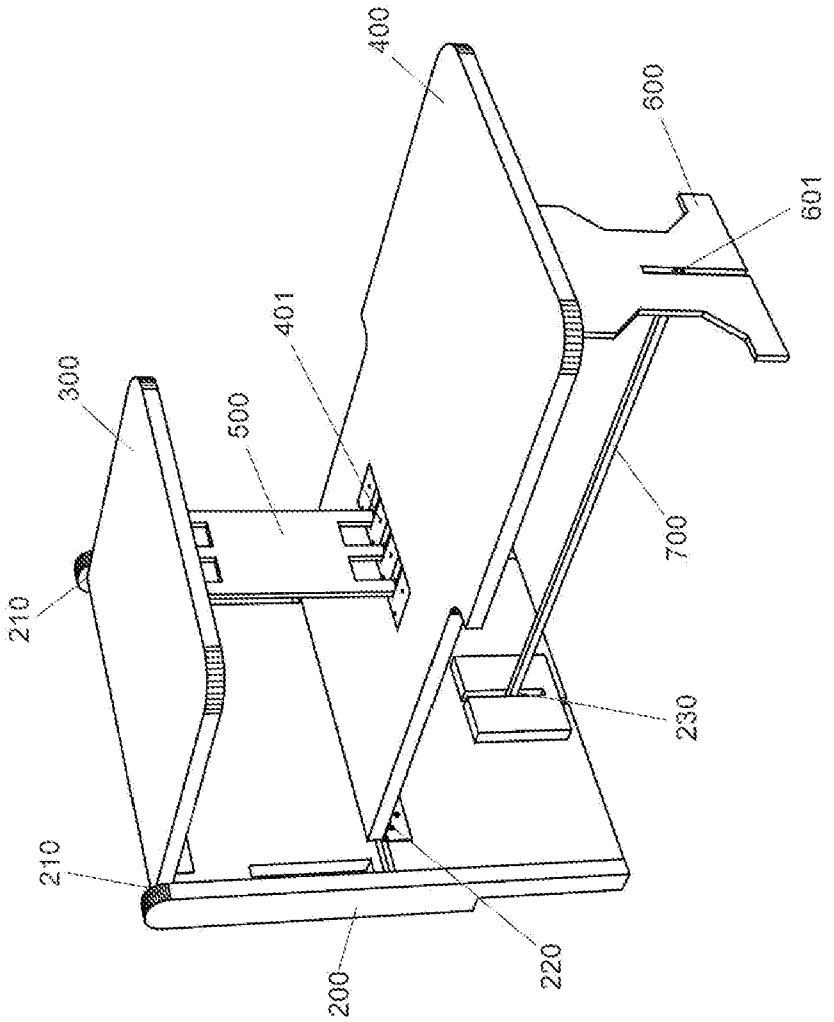


Fig. 1

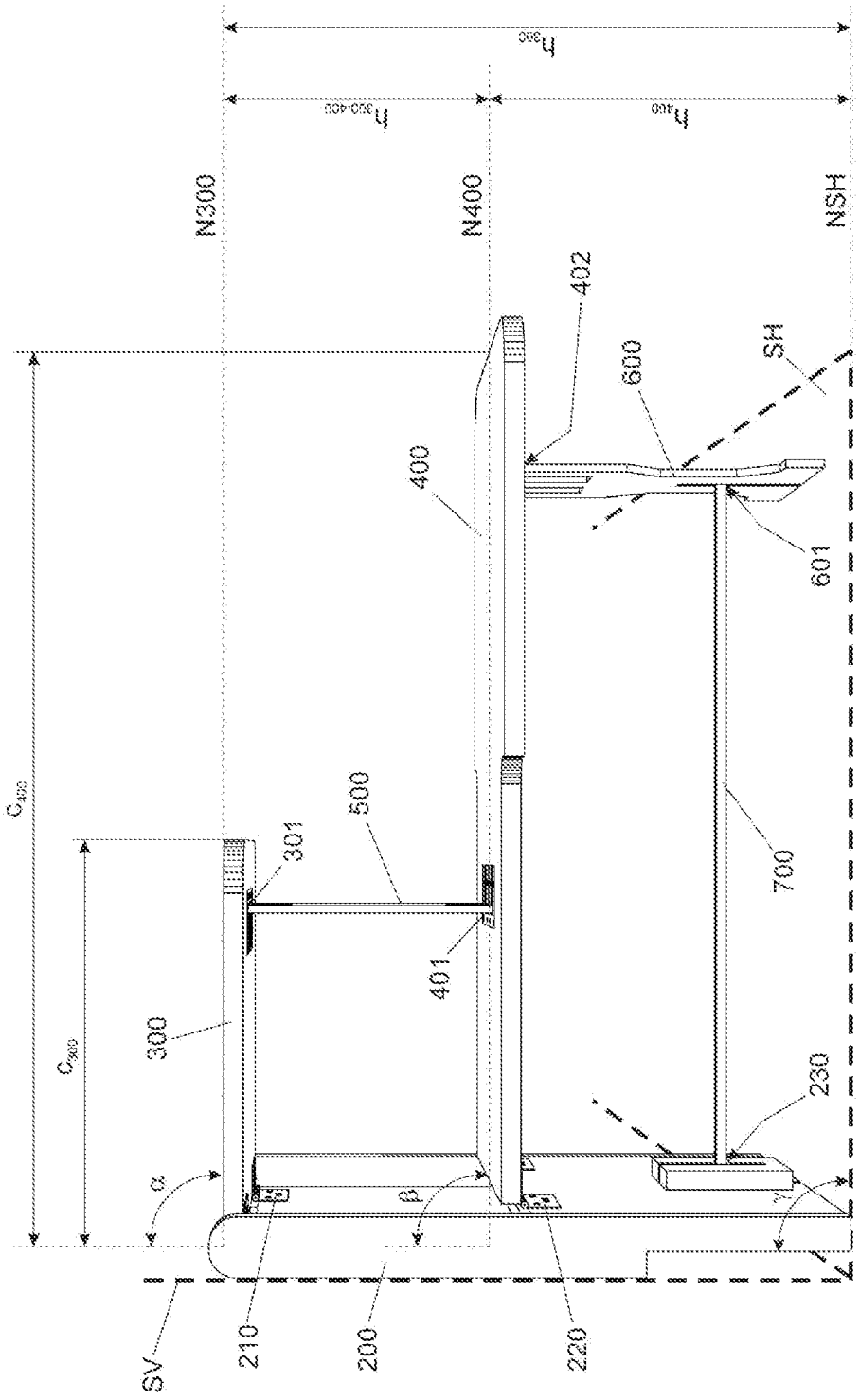

N300
N400
NSH
SH
SV
200
210
220
230
300
301
400
401
402
500
600
601
700
α
β

Fig. 2

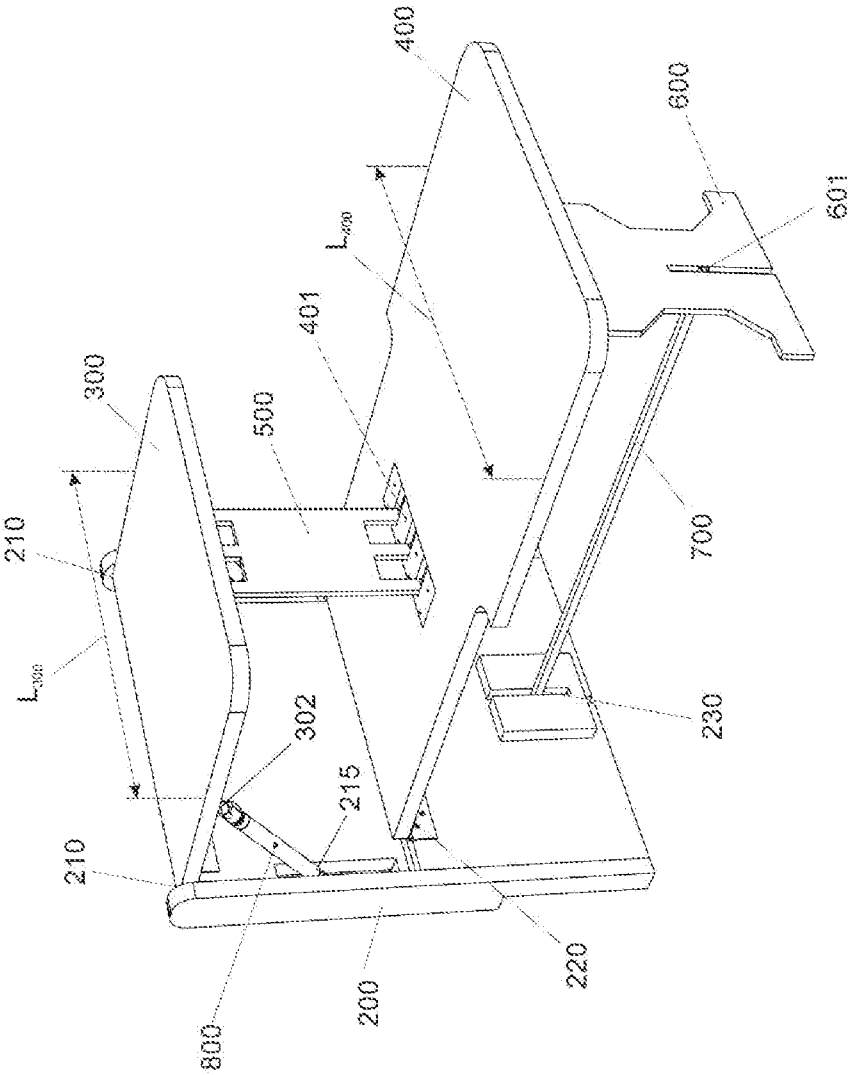


Fig. 3

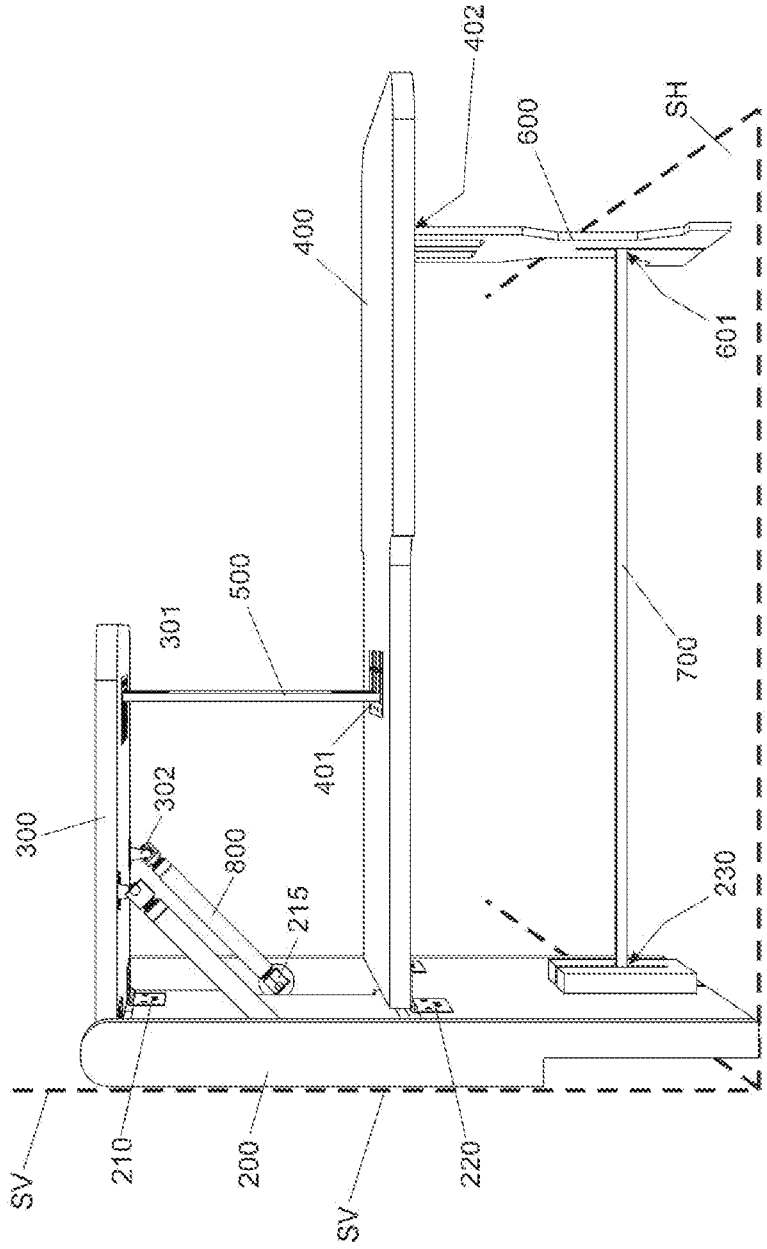

402
600
SH
400
601
500
301
700
401
302
300
800
215
230
SV
210
200
SV
220

Fig. 4

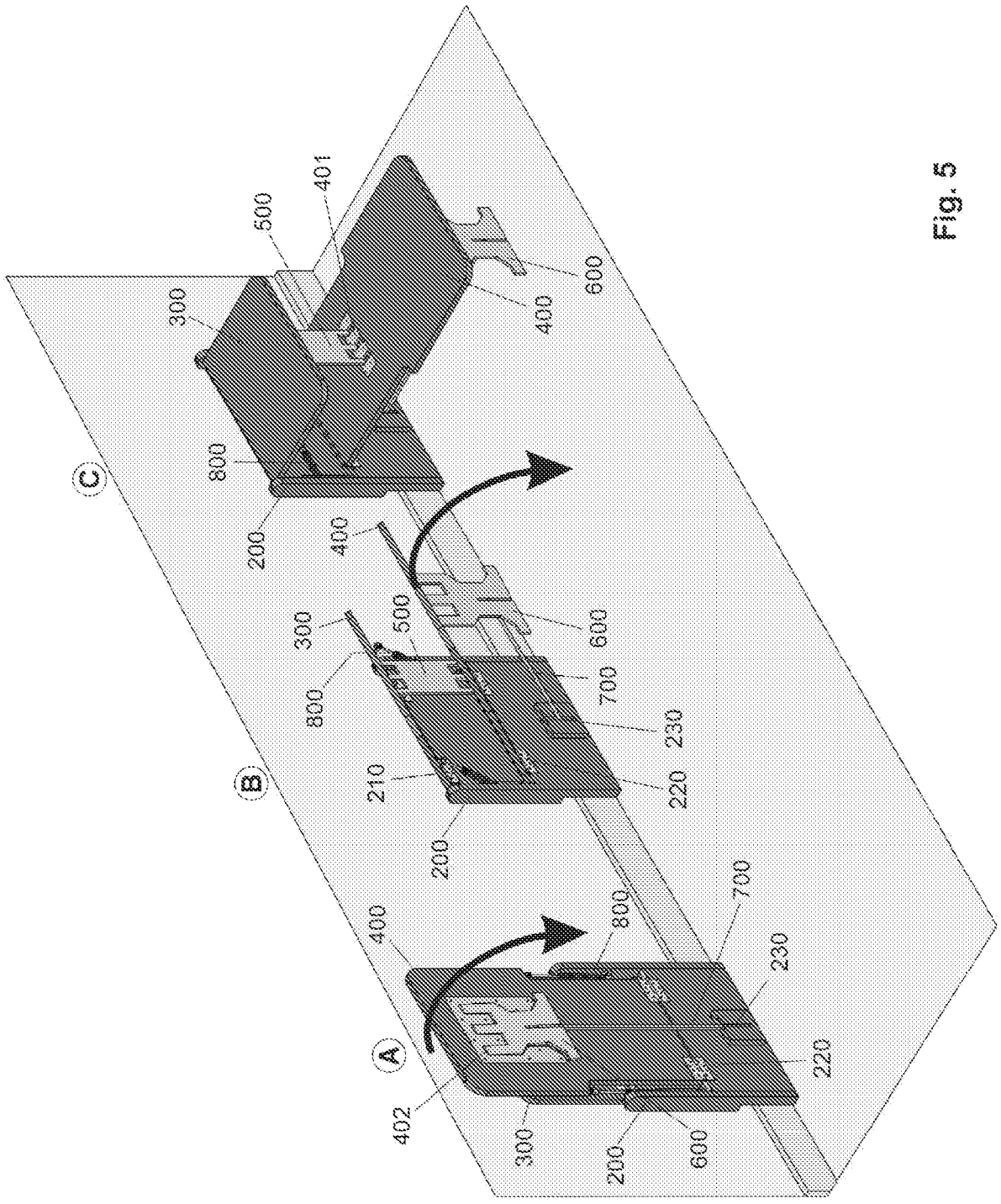


Fig. 5

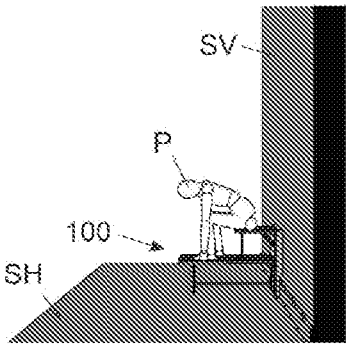


Fig. 6a

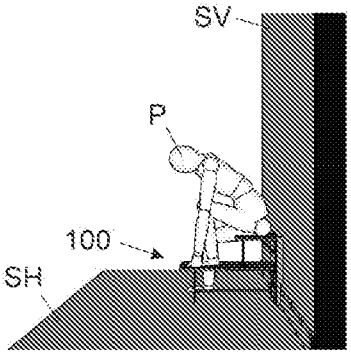


Fig. 7a

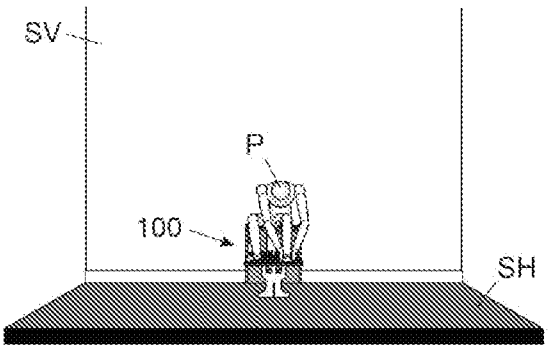


Fig. 6b

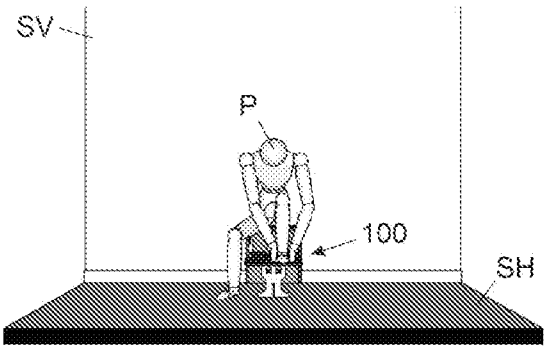


Fig. 7b

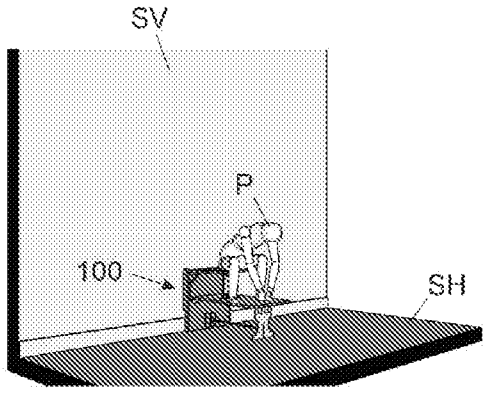


Fig. 6c

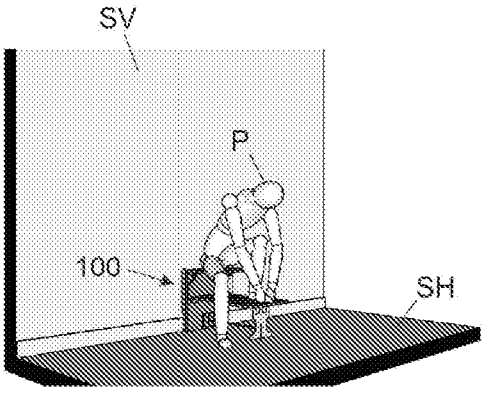


Fig. 7c

COLLAPSIBLE APPARATUS FOR PUTTING FOOTWEAR ON FEET

Technical Field

[001] The present invention pertains to the field of apparatus and implements used together with the use of clothing, notably footwear, especially apparatus to assist in placing footwear on the feet.

Introduction

[002] The present invention refers to a foldable apparatus to assist its user for dressing feet, with convenience and comfort and requiring only a minimum amount of space.

[003] A foldable apparatus for dressing feet, or simply apparatus, comprises a main structure to which a seat element and a supporting element are pivotally attached, both structurally and rotationally dependent on each other and forming, with regard to and together with the horizontal substrate, three levels of different heights.

24 03 23

Background of the Invention

[004] Placing footwear that include socks, pantyhose, shoes, boots, and other items to wear on the feet is a task that involves bending and/or lowering and/or flexing the user's knees to perform it and depending on health conditions, age, flexibility, height, weight, foot dimensions and the like can become exhausting and painful and even impossible to be performed without the assistance of another person.

[005] In addition to the aforementioned difficult factors, there are tight or tight-fitting shoes, high-top shoes, with restricted opening for putting on, zippers, buttons, and similar conditions.

[006] The first solutions to some of these problems came in the form of tools called shoehorns, which are smooth, elongated, and concave elements placed between the heel (or calf) and the shoe, helping to slide the heel into the

shoe.

[007] Other solutions aim to bring the user's feet closer to the user's hands to facilitate the final moments of putting on the shoe, and the tying or closing of the shoes, developed in the form of three-dimensional structures such as benches, trunks, stools, furniture in general and also footrests and other constructions isolated or grouped with accessories.

[008] In this last type of construction, especially in the case of solutions that are bulkier in their construction, an important factor to be considered is precisely the physical space that the structure to assist in dressing the feet will occupy.

State of the Art

[009] In the state of the art, therefore, there are several solutions to assist in dressing footwear configured in the form of three-dimensional structures.

[010] An example is the solution of patent document number JP3885548B2, which discloses and describes a seat for entrance halls that includes a seat and a base for foot support, means of securing the user's heels and footwear storage, in addition to providing supports for canes, bags and the like. The main disadvantages of the furniture described by JP3885548B2 are the exaggerated vertical distance between the seat and the base and the tiny vertical distance between the base and the floor, which make it difficult to take off and put on footwear, and to access and handle zippers, shoelaces, buttons, and the like. In addition, the seat for entrance halls is bulky and not collapsible, requiring precious space.

[011] Another prior art solution is the chair to put on and take off footwear equipped with footrests and armrests from patent document number US2010/0026075A1 which has the same disadvantage related to difference in height between the levels, mentioned in the previous document, added to its volume and the fact that it is attached, without the possibility of being folded or

collapsed, in addition to the lateral limitations of the armrests. The stool described and disclosed by patent document number CN202589224U is a solution which presents similar issues.

[012] Another known device is the stool disclosed by patent document number US10,618,720B1, which describes a cuboid element for footwear storage equipped with a retractable footrest arranged on an inclined front face. The discomfort in using it is visible, due to the proximity of the footrest to the main structure, in addition to the fact that the main structure occupies space without the possibility of being collapsed as a whole.

[013] A similar solution is the stool described in patent document CN107865564A which has one of its legs formed as part of the seat and retractable as a footrest. The structure is unstable and uncomfortable, as there is a great distance between the tip of the footrest and, of course, the stool is not collapsible, foldable, or retractable.

[014] In addition to these solutions, there are also equipment for simple foot support, formed as independent structures as disclosed by the Brazilian patent document PI 9604437-3 or as structures coupled to furniture, doors, or hooks such as those disclosed by patent documents number DE 10 2013 100 589 A1, US 2011/010 1047A1 and DE 19747188A1.

[015] Finally, there are still built-in auxiliary structures such as the one disclosed by patent document number KR20110009776U which discloses a collapsible seat, but with only one seat level and with the floor functioning as a support level, which only configures something similar to a chair, as also disclosed by CN209528809.

[016] There is, therefore, a demand for a folding apparatus for dressing feet capable of overcoming the disadvantages of the prior art and that can be used by the largest possible number of users and with the vast majority of

commercially available footwear.

Objectives of the Invention

[017] Thus, one of the objectives of the present invention is to provide a foldable apparatus with the features of independent claim 1, appended in the present disclosure.

[018] Additional features and feature details are presented in the dependent claims.

DESCRIPTION OF THE DRAWINGS

[019] For better understanding and visualization of the subject matter, the present invention will now be described with reference to the appended figures, representing the obtained technical effect through exemplary embodiments without limiting the scope of the present invention, in which:

Figure 1: shows an anterolateral perspective view of an apparatus according to the invention, in an opened position and ready for use, and showing its main components;

Figure 2: shows a side view of an apparatus of figure 1;

Figure 3: shows an anterolateral perspective view of an apparatus according to the invention, in an opened position and ready for use, and comprising a damping element;

Figure 4: shows a side view of an apparatus of figure 3;

Figure 5: presents superolateral perspective views of an apparatus according to the invention, showing the apparatus in a position A, collapsed, in a position B, in an opening procedure and in a position C, fully opened and ready for use;

Figure 6a: shows a side view of the apparatus of figure 1 with the representation of a person of short stature supporting one foot on the support and the other on the horizontal

substrate;

Figure 6b: shows a front view of figure 6a;

Figure 6c: shows a perspective view of figure 6a;

Figure 7a: shows a side view of the apparatus of figure 1 with the representation of a person of short stature supporting one foot on the support and the other on the horizontal substrate;

Figure 7b: shows a front view of figure 7a; and

Figure 7c: shows a perspective view of figure 7a.

Detailed Description of the Invention

[020] A foldable apparatus for dressing feet, or simply apparatus (100), comprises a main structure (200) to which a seat element or simply seat (300) and a supporting element or simply support (400) are pivotally attached, both structurally and rotationally dependent on each other, which form with the horizontal substrate (SH) on which the apparatus (100) is supported, three levels (N300, N400, NSH) of different heights, preferably parallels, in which the parallelism is independent of their angulation with regard to a vertical substrate (SV).

[021] The seat (300) is attached to the main structure (200) by means of one or more upper rotation elements (210) around which the seat (300) pivots.

[022] The support (400) is attached to the main structure (200) by means of one or more intermediate rotation elements (220), around which the support (400) pivots.

[023] The seat (300) and the support (400) are interlinked by means of one or more connection and traction elements (500), pivotally attached to seat rotation elements (301) and, also pivotally attached to support upper rotation elements (401). Thus, the rotation of the seat (300) follows the rotation of the support (400) and vice versa.

[024] One or more holding elements (600) are pivotally attached to the support (400) by means of lower support rotation elements (402). The supporting element (600) and the main structure (200) are interconnected to each other by means of one or more lower connection and traction elements (700), the connection and traction elements (700) being connected to the supporting element (600) by means of one or more rotation elements (601) and, to the main structure (200), by means of one or more lower rotation elements (230).

[025] The seat (300) has a seat width (L_{300}), a seat length (c_{300}) and a seat height (h_{300}) with regard to the horizontal substrate level (NSH), while the support (400) has a support width (L_{400}), a support length (c_{400}) and a support height (h_{400}) with regard to the horizontal substrate level (NSH).

[026] The widths (L_{300}, L_{400}) can be the same or different, preferably being the same and, if they are different, the condition of the seat (300) should be prioritized, as it is slightly wider than the support (400), that is, the support width (L_{400}) is equal to or less than the seat width (L_{300}), to allow access and, in particular, perfect accommodation, balance and security for the user.

[027] The support (400) must be longer than the seat (300), being the length (c_{400}) of the support (400) from 1.1 to 5 times, preferably from 1.5 to 3.5, preferably from 2 to 3 times the length (c_{300}) of the seat (300), these ranges being variable according to the dimensions of the users and their feet, in which the ideal ratio is one wherein the length (c_{400}) of the support (400) that is 2.4 times longer than the length (c_{300}) of the seat (300). The equivalent free length between seat and support ($c_{300\text{-}400}$) must be at least 0.8 to 2.5, preferably 1 to 2, preferably 1.4 times longer than the seat length (c_{300}). These measurement ratios make it possible to use both people (P) of short stature (figures 6a, 6b, 6c) and people (P) of medium and tall stature (figures 7a, 7b, 7c), without compromising

comfort, as it allows one or two feet to be supported on the support (400) at variable distances, thus suitable for different heights and different sizes of feet. In addition, this difference makes access to the free end of the support (400) and, thus, folding to open and close the apparatus (100) easier.

[028] On other hand, the ratio between the seat height (h_{300}) and the support height (h_{400}) is such that the seat to support height ($h_{300\text{-}400}$) is equivalent to a value between 25% and 55%, preferably 43%, of the seat height (h_{300}) and to a value between 50% and 85%, preferably 78%, of the support height (h_{400}).

[029] The structural and rotational interdependence of the seat (300) and support (400) interconnected by the connection and traction elements (500) allows the seat (300) and support (400) to move together in any traction condition.

[030] Figure 5 shows the apparatus (100) in three different situations. Position A shows the apparatus (100) collapsed, position B shows the apparatus (100) in an opening procedure and position C shows the apparatus fully opened, ready for use.

[031] To set the apparatus (100) from position A to position C, passing through position B, simply apply a force to the free end of the support (400), which makes it rotate around the intermediate rotation elements (220) and promote the turn of the seat (300) which is connected by means of the connection and traction elements (500), pivotally connected to the seat (300) by means of the seat rotation elements (301) and, to the support (400), by means of the upper support rotation elements (401).

[032] When the rotation movement of the support (400) and the seat (300) begins, as described above, the lower connection and traction element (700), pivotally attached to the main structure (200) by means of the lower rotation elements (230) and to the supporting element (600) by means of the rotation

elements (601), promotes the rotation of the supporting element (600) around the lower support rotation elements (402) that connect it to the support (400), in which both the connection and traction element (500) and the supporting element (600) are always kept, preferably, parallel to the vertical substrate (SV).

[033] Once positioned in position C, open, the seat (300), the support (400) and the horizontal substrate (SH) form three levels (N300, N400 and NSH), preferably parallel to each other, perpendicular to the main structure (200), which may vary by application.

[034] Between the seat (300) and the main structure (200)/vertical substrate (SV) an angle (a) is formed that varies from 0° (position A, closed, from figure 5) to 90° (position C, open, from figure 5).

[035] Between the support (400) and the main structure (200)/vertical substrate (SV) an angle (b) is formed that varies from 0° (position A, closed, from figure 5) to 90° (position C, open, from figure 5).

[036] Between the main structure (200) and the horizontal substrate (SH) an angle (g) is formed that varies in the range of 90° ± 25°, preferably 90° ± 15°, depending on the ergonomic and comfort demand of the user.

[037] In a non-limiting embodiment of the invention, the angles (a) and (b), in the open position (C), are different from 90°, and may be greater than 90° ("user is inclined backwards") or less than 90° ("user is inclined forwards"), in which the limit of this angle is determined by the user's ergonomic and comfort need, being in the range of 90° ± 45°, preferably in the range of 90° ± 25°, making the user's access to their feet easier or forcing them to abut the main structure (200) etc. Angles (a) and (b) may be the same or different, that is, the seat (300) and the support (400) may or be parallel to each other or not. As a result, the seat (300) and/or the support (400) may be parallel to the horizontal substrate (SH) or not, alone or together.

[038] Differences between angles (a), (b) and (g) will be possible with the dimensional variation of the other elements of the apparatus (100) such as, for example, but not limited to, the variation in dimensions and/or inclination of the connection and traction element (500) and/or the supporting element (600) and so on.

[039] In another non-limiting embodiment of the invention, one or more damping/traction elements (800) are arranged between the main structure (200) and the seat (300), to which they are pivotally attached by means of joints (215) and (302), respectively. These damping/traction elements (800) have the purpose of, for example, to keep the apparatus (100) in the closed position (A). The apparatus (100) can be opened by simply pulling the support (400) until reaching the open position (C), which remains open with the user's weight on the seat (300) and/or support (400), or just the user's foot on the support (400). After the user leaves the apparatus (100), the damping/traction elements (800) will push (or pull, depending on the type used) the seat (300) and thus the support (400) back to the closed position (A).

[040] The damping/traction elements (800) must be chosen so as to allow smooth movement of the assembly, both in opening and closing the apparatus (100), which may be, but not limited to, shock absorbers, springs, cables or elastics, resilient elements in general, worm drives and other suitable elements, used alone or together.

[041] Rotation elements, according to the invention, are elements arranged between two or more parts or components, allowing rotational movement between each other and around the rotating elements, which may be, but not limited to hinges, bushings, bearings shafts, spheres, and the like.

[042] For all of the above, it is concluded that the apparatus (100) according to the invention solves the problems reported in the related state of the art,

offering a practical and functional, simple, safe, and versatile solution to assist in dressing the feet of the intended users. The dimensional ratios and the formation of three levels (N300, N400, NSH) with regard to the horizontal substrate (SH), of different heights, preferably parallel, regardless of their angulation, provides an unexpected technical effect with regard to similar ones of the same nature, in the prior art.

[043] Rotation elements, according to the invention, are elements arranged between two or more parts or components, allowing rotational movement between each other and around the rotating elements, which may be, but not limited to hinges, bushings, bearings shafts, spheres, and the like.

Final remarks

[044] It is clear that the measures and ratios between measures described for the present invention may vary according to the dimensioning of the apparatus (100).

[045] Exhaustive practical tests, however, have shown that these dimensions and their ratios are highly efficient and effective in safety and convenience provided by the apparatus (100).

[046] In addition, the apparatus (100) of the present invention and said measures and their ratios, are highly reliable and reproducible.

Conclusion

[047] It will be easily understood by those skilled in the art that modifications can be made to the present invention without departing from the concepts set out in the description above. Such modifications should be considered as included within the scope of the present invention. Consequently, the particular embodiments previously described in detail are illustrative and exemplary only and are non-restrictive as to the scope of the present invention, to which the full extent of the appended set of claims and any and all

correspondents thereof should be given.

CLAIMS

1. Foldable apparatus for dressing feet, wherein said apparatus (100) is **characterized** in that it comprises a main structure (200) to which a seat (300) and a support (400) are pivotally attached, structurally and rotationally dependent on each other, which form, together with a horizontal substrate (SH), three levels (N300, N400, NSH) of different heights, preferably parallel.

2. Apparatus according to claim 1, **characterized** in that the parallelism between the seat (300) and support (400) is independent of their angulation (a, b) with regard to a vertical substrate (SV).

3. Apparatus according to claim 1, **characterized** in that the seat (300) is attached to the main structure (200) by means of one or more upper rotation elements (210) around which the seat (300) pivots.

4. Apparatus according to claim 1, **characterized** in that the support (400) is attached to the main structure (200) by means of one or more intermediate rotation elements (220), around which the support (400) pivots.

5. Apparatus according to claim 1, **characterized** in that the seat (300) and the support (400) are interconnected by means of one or more connection and traction elements (500), pivotally attached to seat rotation elements (301) and to support upper rotation elements (401).

6. Apparatus according to claims 1 and 5, **characterized** in that the rotation of the seat (300) follows the rotation of the support (400) and vice versa.

7. Apparatus according to claim 1, **characterized** in that one or more supporting elements (600) are pivotally attached to the support (400) by means of support lower rotation elements (402).

8. Apparatus according to claim 1, **characterized** in that the supporting element (600) and the main structure (200) are interconnected with each other by means of one or more lower connection and traction elements

(700).

9. Apparatus according to claims 1 and 8, **characterized** in that the connection and traction elements (700) are connected to the supporting element (600) by means of one or more rotation elements (601) and, to the main structure (200), by means of one or more lower rotation elements (230).

10. Apparatus according to claim 1, **characterized** in that the support width (L_{400}) is equal to or less than the seat width (L_{300}).

11. Apparatus according to claim 1, **characterized** in that the length (c_{400}) of the support (400) is from 1.1 to 5 times, preferably from 1.5 to 3.5, preferably from 2 to 3 times and preferably 2.4 times the length (c_{300}) of the seat (300).

12. Apparatus according to claims 1 and 11, **characterized** in that the free length between seat and support ($c_{300\text{-}400}$) is at least 0.8 to 2.5, preferably 1 to 2, preferably 1.4 times longer than the seat length (c_{300}).

13. Apparatus according to claim 1, **characterized** in that the ratio between the seat height (h_{300}) and the support height (h_{400}) is such that the seat to support height ($h_{300\text{-}400}$) is equivalent to a value between 25% and 55%, preferably 43%, of the seat height (h_{300}) and to a value between 50% and 85%, preferably 78%, of the support height (h_{400}).

14. Apparatus according to claim 1, **characterized** in that it comprises one or more damping/traction elements (800) between the seat (300) and/or the support (400).

INTERNATIONAL SEARCH REPORT

International application No.
PCT/BR2020/050296

A. CLASSIFICATION OF SUBJECT MATTER
(IPC) A47C9/06 (2006.01), A47G25/84 (2006.01)
(CPC) A47C9/06, A47G25/845
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47C9, A47C4, A47C16, A47K3, A47G25

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Banco de Patentes do INPI-BR

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Espacenet, Derwent World Patents Index (DWPI)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	CN 203802062 U (TIANJIN YOUAI REHABILITATION MEDICINE EQUIPMENT CO LTD) 3 September 2014 (2014.09.03) Paragraph 0020	1 to 4 5 to 14
Y A	CN 205053418 U (YOUNGER LIFE SENIOR LIVING CO LTD) 2 March 2016 (2016.03.02) Figures 2 and 3, and paragraphs 0001 and 00140	1 to 4 5 to 14
Y A	US 2010026075 A1 (ZENISEK ROBERT F [US]) 4 February 2010 (2010.02.04) Figure 2 and paragraph 0047	1 to 4 5 to 14
Y A	CN 202589224 U (ZHEJIANG ANNAN CARBON INDUSTRY TECHNOLOGY CO LTD) 12 December 2012 (2012.12.12) Figure 1 and paragraph 0014	1 to 4 5 to 14

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search	Date of mailing of the international search report
4/04/2021	12/04/2021
Name and mailing address of the ISA/ INSTITUTO NACIONAL DA PROPRIEDADE INDUSTRIAL Rua Mayrink Veiga nº 9, 6º andar cep: 20090-910, Centro - Rio de Janeiro/RJ Facsimile No.	Authorized officer **Mauki Faria Esposito** Telephone No. +55 21 3037-3493/3742

INTERNATIONAL SEARCH REPORT

International application No.
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