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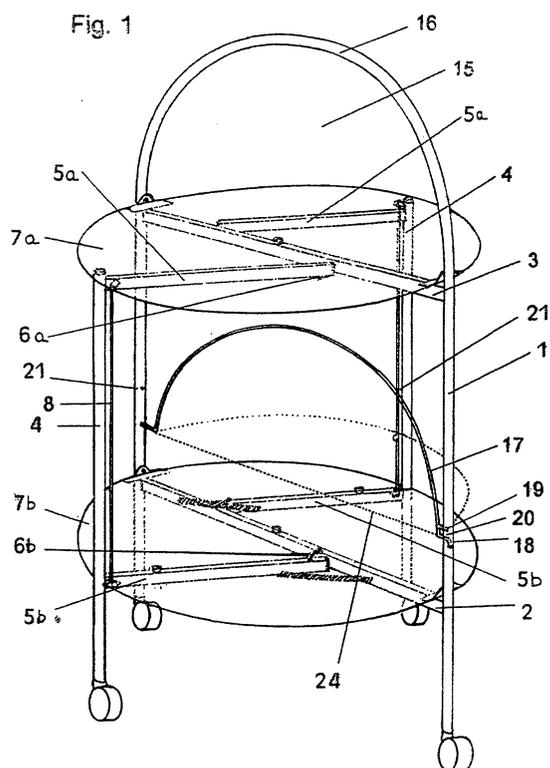
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(54) **FOLDABLE TROLLEY**

(57) This invention consists of a folding trolley, with collapsible surfaces (7a, 7b) which contains a fixed structure (15) and structures carrying moving legs (4) eccentrically foldable over the fixed structure. There are

unfolding stops and means for inserting and supporting the surfaces over the moving legs, as well as accessories such as a protection rod for bottles or other recipients or support items for additional surfaces.

For industrial application in making folding trolleys.



Description

[0001] This invention consists of a folding trolley whose structure allows this to fold by one or both of its halves collapsing, at the same time as enabling proper securing in both the folded and unfolded positions.

Statement of the state of the art.

[0002] There are already known folding trolleys working by collapsing systems applicable to rectangular surfaces, in which an upper surface and lower surface are joined by stays set in each of their vertices. The means for securing these in the unfolded position is by gravity and pressure between the different articulation items, and in the folded position, only by the pressure existing between said items. The structure of said trolleys means that the support surface has to be rectangular, or roughly rectangular, without any surfaces with pronounced curves having a firm support base which allows these to be used.

[0003] Particularly, GB 1 453 515 A, consists on a folding trolley consisting of a fixed frame structure and upper and lower surfaces 15 able to collapse in respect of an axis located on the plane formed by the fixed structure or very close to this, wherein the fixed structure sustains hinging means for hinged structures 36 in turn bearing moving legs, said hinged structures for supporting the moving legs being the base for supporting said collapsible surfaces in the unfolded position. The structures are articulated on both vertical edges of the fixed structure, and the surfaces have rectangular shape.

[0004] US 1963594 refers to a foldable base to support a surface formed by two structures articulated in a vertical axis passing through the center of each of said structures.

[0005] This invention covers an auxiliary trolley folding by collapsing to allow surfaces of any shape to be used, with securing means for each of the items and allowing auxiliary items to be used such as a protection bar to stop bottles sliding out, or auxiliary support surfaces.

[0006] In order to make the following explanation clearer and more intelligible, three sheets of drawings are included with this descriptive report, which represent the essence of this invention in five figures, and in which:

[0007] Figure 1 represents a perspective view of the folding trolley of the invention which, as an example, has been given a round shape (in the unfolded position).

[0008] Figure 2 shows a perspective view of the central structure of the folding trolley, supporting fixed legs.

[0009] Figure 3 shows a perspective view of the folding structure, supporting moving legs.

[0010] Figure 4 shows a plan view of the trolley covered by the invention.

[0011] Figure 5 shows a perspective view of the surfaces folding down by collapsing, as well as the stays or struts which join the upper and lower surfaces.

[0012] In said figures one can appreciate, indicated with number 1, each of the side legs which form a frame structure 15. 2 and 3 respectively represent lower and upper crosspieces, which make the frame structure solid, at the same time as said crosspieces sustain other articulation items. 4 are folding legs, 5a and 5b being the joining tubes or pieces between the moving legs 4 and the crosspieces of the frame 2 and 3, 6a and 6b being hinge bolts or pins slightly displaced from the crosspiece, whose free ends are opposite each other, 7a and 7b respectively showing upper and lower surfaces which form the support surface of the trolley. 8 is a joining stay between said upper and lower surfaces, 9a and 9b representing supports for surfaces 7a and 7b and the hinging of these for folding down, 10 representing a central support for surfaces 7a and 7b. 11 are side supports for surface 7a located at the top end of the moving legs 4, 12 supports for surface 7b located over the joining tube or part between the folding legs 4 and the crosspiece of the frame structure 15, 13 being recesses made in the lower surfaces 7b for allowing their location perpendicular to legs 4, 14a and 14b respectively showing articulations existing between each upper surface 7a and its corresponding lower one 7b. We again point out that 15 represents the central frame. 16 shows the upper part of the frame which must match the collapsed semi-surface.

[0013] 17 is a protection bar for stopping bottles or other recipients sliding out, articulated in respect of structure 15 by means of hinge pins 18 in the form of bolts, which are located over holes or cavities designed for this purpose. 19 shows a ridge or rib for securing the rod in its folded position over a recess 20 designed in the leg 1 of the structure 15 or, in the unfolded mode, by the leg itself 1. 21 shows a support ridge for a possible tray or accessory surface, which could be a hole for housing a shaft or pin.

[0014] 22 shows an elastic means joining the lower crosspiece 2 with the part 5b joining the moving legs 4 with said crosspiece, so that this tends to retract, both in the folded and unfolded position, with the point of greatest tension being at an intermediate position between both of these.

[0015] According to one form of embodiment, as presented in the previous figures, there is a central frame structure 15 holding two fixed legs 1, joined together by two crosspieces, one above 3 and one below 2, defining an arch at the top essentially coinciding in shape with the upper surface 7a when folded down.

[0016] Crosspieces 2 and 3 of said frame structure have, set out in respect of their centre and their longitudinal axis on a horizontal plane, hinge pins 6 for holding a structure formed of moving legs 4 and elements 5a and 5b for joining said legs 4 to the hinge pins 6. Between the crosspieces 2 of the structure 15 and the joining elements 5b there is a spring 22 or elastic item so that its maximum extension is between the folded position and the unfolded position, so that the tendency in

each of the cases will be to maintain the respective positions. The unfolding of the moving legs 4 is limited by the support of the end 23 of each of the joining parts 5 a and 5 b over the corresponding crosspiece 2 and 3. 24 shows a possible embodiment in which, depending on the shape of the bar 17, at least one similarly hinged surface is formed.

[0017] After the structures bearing the moving legs 4 have extended, the position of said legs is situated on a line perpendicular to the centre of the line which defines the base of the central frame 15.

[0018] The collapsing of surfaces 7 a and 7 b is through the collapsing axis located roughly on the plane of the central structure 15. The upper surface 7a has a ridge fitted with a hinge pin which, by means of a coupling rod 8 between both surfaces 7a and 7b, links up with a hinge pin located in the lower surface 7b. The rod 8 crosses the lower surface 7b along a slot made in this for the purpose.

[0019] To obtain the proper situation of the lower surface, since said surface would cross the moving legs 4 in the unfolded position, a recess 13 has been designed in said surface 7b so that the leg is inserted inside this, preventing it from articulating whilst the surfaces are unfolded.

[0020] Furthermore, when two of the surfaces 7a and 7b are in the collapsed state, and the corresponding leg 4 is folded away, said leg 4 prevents the surface from unfolding, also holding rod 8 for joining the top and bottom surfaces.

[0021] At the upper ends of the moving legs 4 there are items 11 for supporting the upper surface 7a, whilst the lower one rests on ridges designed in the joining part 5b of the moving structure.

[0022] In at least one of the sides there can be a rod 17 which takes the form of the contour over which it folds by means of a pin 18. Also, in a zone close to the ends of said rod 17 there is a ridge 19 which allows securing in the collapsed position, on the plane of structure 15, over a recess or hole 20 made in this, and in the open position on the contour of the fixed leg 1 itself.

[0023] There are also support ridges 21, which could be holes for housing shafts or pins in which to insert a part, over the frame and over the moving legs for possibly locating further surfaces or semi-surfaces on these.

[0024] The rod 17 can constitute the frame or limit of a surface which would be bounded by the closing line 24, represented as a dotted line, also hinged.

[0025] This invention is for industrial application in making folding trolleys.

[0026] This invention consists of a folding trolley whose structure allows this to fold by one or both of its halves collapsing, at the same time as enabling proper securing in both the folded and unfolded positions.

Claims

1. Folding trolley, consisting of a fixed frame structure (15) and upper (7a) and lower (7b) surfaces able to collapse allowing to be folded by one or both of its halves in respect of an axis located on the plane formed by the fixed structure or very close to this, characterised in that the fixed structure (15) sustains at least two fixed support legs (1) and hinging means for hinged structures in turn bearing moving legs (4), said hinged structure for supporting the moving legs (4), being the base for supporting said collapsible surfaces (7a, 7b) in the unfolded position, and the position of each of said moving legs when unfolded being located on a line perpendicular to the centre of a line defined by the base of the said fixed frame structure (15).
2. Trolley, according to claim 1, characterised in that it comprises a fixed frame structure with a pair of spaced upright members (1) and a pair of crosspieces (2,3), and in that the hinging means for the hinged structures sustaining the moving legs (4) consists of two pins (6a, 6b) eccentric with respect to the plane of said fixed frame structure and to the centre of the crosspieces (2, 3) the free ends of said pins being facing each other, opposite or in the same direction, and are able to hinge the joining tubes or parts (5a, 5b) set between the moving legs (4) and said pins (6a, 6b).
3. Trolley, according to claim 2, characterised in that the ends of the joining tubes or parts (5a, 5b), set between the collapsible legs and the pins (6a, 6b) represent a stop for the hinging movement in the unfolding position.
4. Trolley, according to claims 1 and 2, characterised in that there is a spring or elastic means between the structure (15) and the joining tubes or parts (5a, 5b) set between the collapsible legs and the hinge pins (6a, 6b) whose maximum extension is located at an intermediate position between folded and unfolded.
5. Trolley, according to claim 1, characterised in that the frame (15) and the hinged structures supporting the moving legs (4) have supports (10, 11, 12) for the surfaces (7a, 7b).
6. Trolley, according to claim 1, characterised in that the upper (7a) and lower (7b) surfaces are joined by means of a stay or strut (8) hinged to each of said surfaces, said stay going along a slot made in the lower surfaces (7b).
7. Trolley, according to claim 1, characterised in that the lower surface has a recess which drops over the

leg (4) in the unfolded position.

8. Trolley, according to claim 1, characterised in that the frame (15) supports at least one protection rod for bottles (17) which essentially adopts the external profile of the respective surfaces (7b) and which is collapsible in respect of the axes formed by its ends in their insertion in said structure (15). 5
9. Trolley, according to claim 8, characterised in that the bottle protection rod (17) has a ridge in a zone close to its hinged end, which enables this to be secured in the collapsed position in combination with a recess located in the leg (1) of the structure (15), and secured in its unfolded position in combination with the external profile of said leg (1). 10
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10. Trolley, according to claim 1, characterised in that there are ridges or seats for shafts or pins (21) in the fixed legs (1) and the moving legs (4) for supporting additional surfaces. 20
11. Trolley, according to claims 1, 8 and 10, characterised in that there is at least one hinged surface (24) having one edge as the shape of the rod (17). 25

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Fig. 2

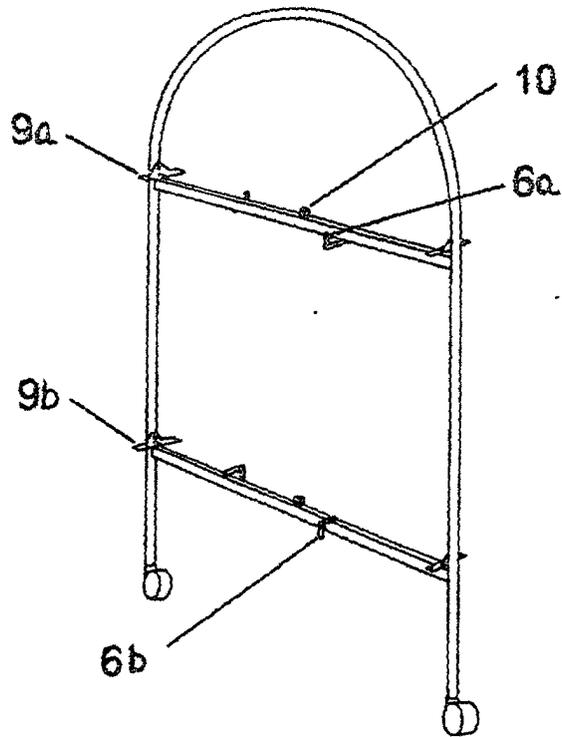


Fig. 3

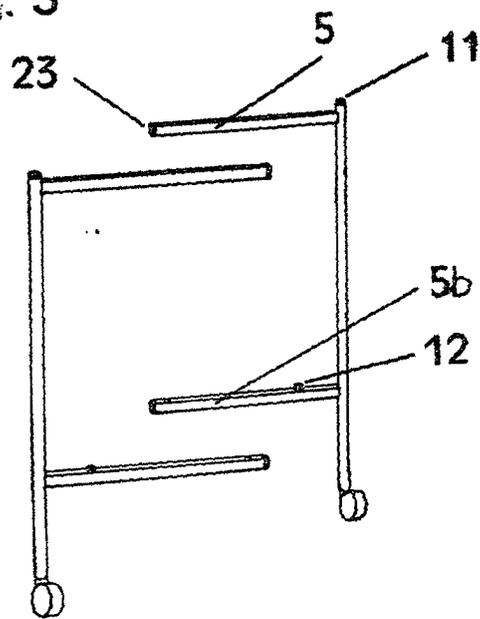


Fig. 4

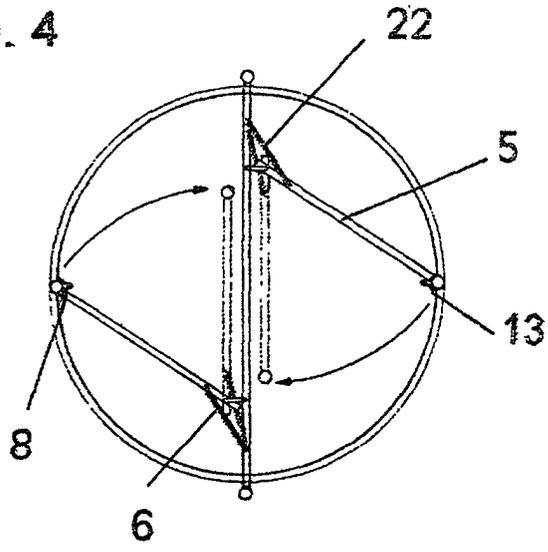
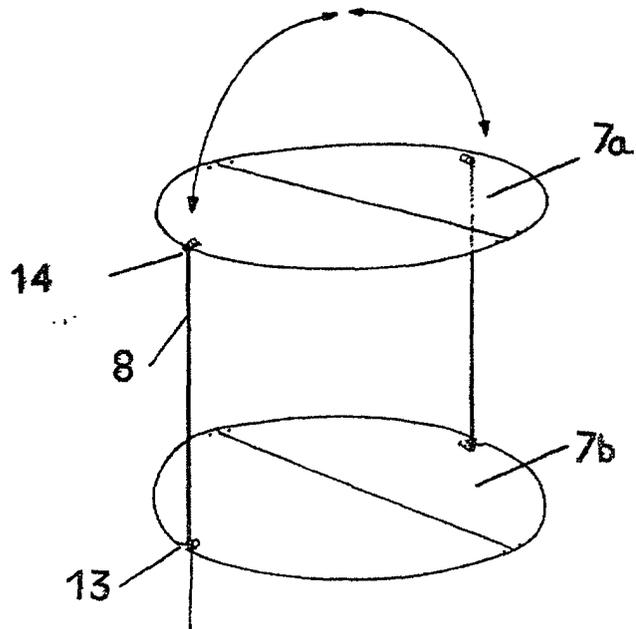


Fig. 5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES 99/00261

A. CLASSIFICATION OF SUBJECT MATTER ⁶ :		
IPC6 A47B 31/04		
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)		
IPC6 A47B 31/04		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
EPODOC, WPIL, CIBEPAT		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 1963594 A (E.J. SCHWABE) 19 June 1934 (19.06.34) page 1, line 64- page 2, Line 55; figures	1-3,5
A	US 2005566 A (E.J. SCHWABE) 18 June 1934 (18.06.34) the whole document	1-3
A	GB 959706 A (BERTROM JONES) 03 June 1964 (03.06.64) page 1, line 55- page 2, line 15; figure 1	1
A	FR 2492640 A (BORDI) 20 April 1982 (20.04.82) page 2, line 30- page 3, line 39; figures	1
A	GB 1453515 A (BREMSHEY) 27 October 1976 (27.10.76) figure 1	6
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>		
Date of the actual completion of the international search 06 October 1999 (06.10.99)		Date of mailing of the international search report 02 November 1999 (02.11.99)
Name and mailing address of the ISA/ S.P.T.O.		Authorized officer
Facsimile No.		Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No
PCT/ES 99/00261

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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