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(54) **Metal wire shelf with collapsible sides, particularly for trolleys and the like**

Regal aus Draht mit klappbaren Seiten insbesondere für Handwagen und dergleichen

Etagère en fils de fer avec des côtés pliables en particulier pour des chariots et similaires

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(56) References cited:
CH-A- 272 645 **FR-A- 2 779 211**
GB-A- 415 028 **GB-A- 2 222 102**
US-A- 2 903 137

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Description

[0001] This invention relates to a collapsible-sided shelf, in particular of metal or non-metal wires, rods and rod-like elements, particularly for trolleys and fixed support devices.

[0002] Shelves of plastic-coated metal wire, rods or rod-like elements are known, to be hooked at different heights to side walls provided or not provided with wheels, to form a trolley or a support device in which these (removable) shelves form a consolidating part of the trolley or device. These shelves comprise a substantially rectangular flat base part plus sides. The sides may form an integral part of the base part, in which case they are rigidly set substantially at 90° to the base part which, with the sides, assumes either a U-configuration, or a tray configuration if bounded by four sides. The overall size of such a shelf is considerable, and negatively affects transport and storage costs.

[0003] To reduce the overall size of such shelves it has already been proposed to provide them with collapsible sides which can be rotated from a substantially flat position lying on the base part to a position rotated through 90° therefrom. For this purpose the sides are provided with a number of rods, wires and rod-like elements shaped approximately as a half-closed hook which by engaging a surrounding rod of the base part enables the sides to be rotated away from and towards this base part.

[0004] Although this solution solves the size problem, it has certain drawbacks: the shelf is unstable and therefore also makes the trolley structure unstable; the shelf is uncomfortable to install between the side walls; and fitting the sides to the base part involves relatively complicated manual operations which cannot be automated.

[0005] An object of this invention is to provide a shelf provided with at least one side which forms one piece with the base part and can be made to manually assume a plurality of stable angular positions relative to said base part.

[0006] A further object of the invention is to provide a trolley or a fixed support structure in which the shelf of the invention is applied.

[0007] These and further objects which will be apparent from the ensuing detailed description are attained by a shelf and a trolley or support device as defined in the accompanying claims 1 and 16, respectively.

[0008] The invention will be more apparent from the detailed description of some preferred embodiments thereof given hereinafter by way of non-limiting example with reference to the accompanying drawings, on which:

Figure 1 is a perspective view of a shelf of the invention provided with two sides shown in their erect position;

Figure 2 is a perspective view of the shelf of the invention with its sides collapsed onto the base part;

Figure 3 is a partial section through the shelf taken

on the line 3-3 of Figure 1;

Figure 4 is a perspective view of a trolley or non-wheeled structure in which a shelf of the invention is mounted;

Figures 5a, b, c, d, e show schematically the different possible positions which the sides can assume relative to the base part;

Figures 6a, 6b are two front perspective views of a further variant of a shelf according to the invention.

[0009] In the figures the reference numeral 1 indicates the shelf of the invention overall. It comprises a base part 2 and two sides 3 forming one piece with said base part. Both the base part 2 and the sides 3 are formed from metal or non-metal wires, rods or rod-like elements assembled together and surface-treated.

[0010] In particular, in the illustrated example, the base part 2 comprises three parallel longitudinal rod-like elements 4a, b, c (two side or outer elements 4a, b, bent at 90° at their outer ends at 4d, and one intermediate element 4c) and a series of parallel transverse rod-like elements 5 rigid with the three longitudinal rod-like elements 4a, b, c. The transverse elements 5 and longitudinal elements 4a, b, c involve only the base part 2.

[0011] Spaced between the transverse elements 5 and fixed to the longitudinal elements 4a, b, c of the base part 2, there are provided metal and non-metal elements of strap form, indicated by 6, which are parallel to each other and, in that portion fixed to the base part 2, also parallel to the transverse elements 5.

[0012] According to the invention these straps are prolonged beyond the base part 2 to extend into the sides 3 and form a part of the structure of these latter.

[0013] More specifically, those portions of said straps which extend beyond the base part 2 are fixed, after a certain suitable free spacing distance indicated by 7, to two (rod-like) parallel stringers 8a, b bounding the sides 3, these latter being completed by a series of parallel rod-like elements 9 also fixed to the stringers 8a, b. Advantageously, the outer stringers 8b project outwards at their ends (at 10).

[0014] The base part 2 and sides 3 hence form one piece which can be produced entirely automatically without manual intervention.

[0015] The material of the straps 6 is chosen such that the sides 3 can be made to assume any position relative to the base part 2 by being bent (in the opening or closure direction) manually and without particular force along their free portion 7, their assumed position persisting after the manual intervention ceases. The material is also chosen such that even after the position of the sides has been changed a certain number of times, the straps do not fracture within those free portions 7 in which the repeated bending occurs. Typical materials suitable both for bonding and for changing the position of the sides and their stability in the desired position are metals in general or other materials.

[0016] For example, steel wire covered with a thermo-

setting or thermoplastic plastic can be used.

[0017] The shape of the straps is such as to offer a low resistant moment to change in position of the sides (ie in the direction of side rotation relative to the base part) but to offer considerable resistance to any force exerted transversely to the straps in the direction of the arrows F of Figure 1, so stabilizing not only the structure of the shelf but also, in consequence, the structure of the trolley or non-wheeled support structure to which the shelf is hooked or connected.

[0018] In the case of a trolley or non-wheeled element comprising conventional side walls of inverted U-shape provided at different heights with groups of parallel crosspieces 12 joining together the legs of the U and rigid with them, the shelf 1 of the invention is mounted (either with the sides 3 collapsed onto the base part or with the sides 3 raised) on said crosspieces 12 such that the bent appendices 4d of the base part lie on the outside of the crosspieces and the base part of the shelf rests on these latter. If collapsed, the sides are then rotated to assume a position at approximately 90° to the base part, whereas the projecting parts 10 of the outer stringers 8a of the sides engage the legs of the U to prevent any outward rotation of the sides should an accidental thrust be applied to them.

[0019] The scope of the invention includes different embodiments of the shelf and sides in terms of the number and arrangement of their constituent rods, wires or the like. Instead of having a mesh configuration, the shelf and its sides could be formed with solid flat elements connected together by straps or similar elements. The same applies to the number of straps 6 used, which could be reduced to two. The straps 6 could also be limited in length to just the portion 7 plus short extensions to enable it to be fixed to the sides 3 and to the base part 2.

[0020] As can be seen from Figures 5a, b, c, d, e, the proposed embodiment of the invention enables the sides 3 to be positioned in various spatial arrangements.

[0021] The number of sides could also be limited to one or be such as to totally surround the base part 2 (Figures 5d and 5e).

[0022] Figures 6a, 6b show a variant of the aforedescribed embodiments (those shelf parts in common with the aforedescribed embodiments are indicated by the same reference numerals thereas).

[0023] The shelf 13 of this variant is substantially identical to the lastly described embodiment and also comprises a base part 2 and sides 14 forming one piece with the base part, to which they are connected such as to enable their position to be modified as already described.

[0024] However, the sides 14 also comprise hooking elements 15, preferably provided on the ends of said sides.

[0025] The hooking elements 15 have a vertical part 15A and a hook-bent end part 15B. The hooking elements are preferably formed by prolonging the outside

bars 16A, 16B defining the ends of the sides 14.

[0026] The length L of the hooking elements 15 is such that when the relative side 14 has been folded onto the base part 2 (Figure 6B), said hooking elements 15 lie completely within the base part.

[0027] The hooking elements 15 are arranged to hook onto an overlying shelf by engaging a horizontal rod-like element 16 of a side 14 in the free space between the vertical end bars 16A, 16B of the side and the immediately adjacent vertical bars 16C, D.

[0028] To connect the shelves of this variant to a crosspiece 17, for example provided inside a cupboard or connected to a support structure 18 (partially shown in Figure 6a), preferably also rod-like, comprising bent ends 20 able to cooperate with the bent ends 15B of the hooking elements 15, and a central part bent to straddle the crosspiece 17.

Claims

1. A shelf comprising a base part (2) and at least one side (3) hingedly connected with said base part along a substantially straight side edge, **characterised in that** to enable the side (3) to assume and to maintain various positions relative to the base part (2), the side (3) and base part (2) are rigidly joined together along said side edge by at least two deformable, strap-like elements the shape of the straps being such as to offer a low resistant moment to bending between the base part and the at least one side along said edge, but to offer considerable resistance to any force exerted transversely thereto.
2. A shelf **characterised in that** the base part (2) and the side (3) are constructed of metal wires, rods or rod-like elements.
3. A shelf **characterised in that** the base part (2) and the side (3) are constructed of non-metal wires, rods or rod-like elements.
4. A shelf as claimed in claim 1, wherein the straps (6) extend along the base part (2) and the side (3) and include an intermediate deformable part.
5. A shelf as claimed in claim 1, **characterised in that** the base part (2), the side (3) and the deformable elements (6) are formed in such a manner as to enable the side to be positioned parallel to and in contact with the base part or in any other angular position relative to that edge of said base part to which said side is connected.
6. A shelf as claimed in claim 1, **characterised by** comprising resting or hooking members (4d; 15) arranged to cooperate with a support structure (11,

12; 17, 18).

7. A shelf as claimed in claims 6, **characterised in that** the resting members are provided on the base part (2) as hooks (4d) which form an angle of about 90° with the base part. 5
8. A shelf as claimed in claim 6, **characterised in that** the hooking members (15) are provided on at least two sides (14) positioned on two parallel edges of the shelf (2), said hooking elements being arranged to hook onto an overlying shelf. 10
9. A shelf as claimed in claim 8, **characterised in that** the hooking members (15) comprise a first straight part (15A) terminating with a terminal part (15B) bent as a hook. 15
10. A shelf as claimed in claim 8, **characterised in that** the hooking members (15) are the prolongation of end bars (16A, B) laterally bounding each side (14). 20
11. A shelf as claimed in claim 8, **characterised in that** the length (L) of the hooking members (15) is such that when the relative side (14) has been folded onto the base part (2), said hooking elements (15) lie within said base part (2). 25
12. A shelf as claimed in claim 8, **characterised in that** the hooking members (15) engage a lower horizontal rod-like element (16) of the sides (14) by passing through the free space provided between the end bars (16A, B) of the side and the bars (16C, 16D) immediately adjacent to these latter. 30
13. A shelf as claimed in claim 8, **characterised by** comprising at least two support elements (19) for removably connecting the shelves to a crosspiece (17), said support element (19) having end parts (20) shaped to cooperate with the terminal parts (15B) of the hooking elements, and a central part (21) shaped to straddle said crosspiece. 35 40
14. A shelf as claimed in claim 13, **characterised in that** the support element (19) is rod-like. 45
15. A shelf as claimed in one of the preceding claims, **characterised in that** at least the deformable elements (6) are constructed of steel covered with a thermosetting or thermodeformable plastic material. 50
16. A trolley or support device provided with at least one shelf conforming to one or more of the preceding claims. 55

Patentansprüche

1. Regalfach, umfassend einen Basisteil (2) und zumindest eine Seite (3), die entlang einer im Wesentlichen geraden Seitenkante klappbar mit dem Basisteil verbunden ist, **dadurch gekennzeichnet, dass** der Seite (3) ermöglicht wird, verschiedene Stellungen in bezug auf den Basisteil (2) einzunehmen und beizubehalten, wobei die Seite (3) und der Basisteil (2) entlang der Seitenkante durch zumindest zwei verformbare Elemente bandartig starr miteinander verbunden sind, wobei die Form der Bänder von einer solchen Art ist, dass sie zwischen dem Basisteil und der zumindest einen Seite entlang der Kante ein geringes Widerstandsmoment bietet, in bezug auf jedwede quer dazu ausgeübte Kraft jedoch einen beträchtlichen Widerstand bietet.
2. Regalfach, **dadurch gekennzeichnet, dass** der Basisteil (2) und die Seite (3) aus Metalldrähten, -stäben oder stabartigen Elementen aufgebaut sind.
3. Regalfach, **dadurch gekennzeichnet, dass** der Basisteil (2) und die Seite (3) aus Nichtmetalldrähten, -stäben oder stabartigen Elementen aufgebaut sind.
4. Regalfach nach Anspruch 1, wobei sich die Bänder (6) entlang des Basisteils (2) und der Seite (3) erstrecken und einen verformbaren Zwischenabschnitt aufweisen.
5. Regalfach nach Anspruch 1, **dadurch gekennzeichnet, dass** der Basisteil (2), die Seite (3) und die verformbaren Elemente (6) in einer solchen Weise gebildet sind, dass der Seite ermöglicht wird, parallel und in Kontakt mit dem Basisteil oder in jeder beliebigen Winkelposition in bezug auf jene Kante des Basisteils, mit der die Seite verbunden ist, angeordnet zu werden.
6. Regalfach nach Anspruch 1, **dadurch gekennzeichnet, dass** es Auflage- oder Einhakelemente (4d; 15) umfasst, die angeordnet sind, um mit einem Halteaufbau (11, 12; 17, 18) zusammenzuwirken.
7. Regalfach nach Anspruch 6, **dadurch gekennzeichnet, dass** die Auflageelemente als Haken (4d) am Basisteil (2) bereitgestellt sind, die mit dem Basisteil einen Winkel von etwa 90° bilden.
8. Regalfach nach Anspruch 6, **dadurch gekennzeichnet, dass** die Einhakelemente (15) an zumindest zwei Seiten (14) bereitgestellt sind, welche an zwei parallelen Kanten des Regalfachs liegen, wobei die Einhakelemente so angeordnet sind, dass

sie an einem darüberliegenden Regalfach einhaken.

9. Regalfach nach Anspruch 8, **dadurch gekennzeichnet, dass** die Einhakelemente (15) einen ersten geraden Abschnitt (15A) umfassen, der mit einem als Haken gebogenen Endabschnitt (15B) endet. 5
10. Regalfach nach Anspruch 8, **dadurch gekennzeichnet, dass** die Einhakelemente (15) die Verlängerung von Endstäben (16A, B) sind, die jede Seite (14) seitlich begrenzen. 10
11. Regalfach nach Anspruch 8, **dadurch gekennzeichnet, dass** die Länge (L) der Einhakelemente (15) von einer solchen Art ist, dass die Einhakelemente (15) innerhalb des Basisteils (2) liegen, wenn die entsprechende Seite (14) auf den Basisteil (14) geklappt wurde. 15 20
12. Regalfach nach Anspruch 8, **dadurch gekennzeichnet, dass** die Einhakelemente (15) durch ein Verlaufen durch den freien Raum, der zwischen den Endstäben (16A, B) der Seite und den unmittelbar neben diesen liegenden Stäben (16C, 16D) bereitgestellt ist, mit einem unteren waagerechten stabartigen Element (16) der Seiten (14) eingreifen. 25
13. Regalfach nach Anspruch 8, **dadurch gekennzeichnet, dass** es zumindest zwei Halteelemente (19) zum abnehmbaren Verbinden der Regalfächer mit einem Querbalken (17) umfasst, wobei das Halteelement (19) Endabschnitte (20), die so geformt sind, dass sie mit den Endabschnitten (15B) der Einhakelemente zusammenwirken, und einen Mittelabschnitt (21), der so geformt ist, dass er auf dem Querbalken aufsitzt, aufweist. 30 35
14. Regalfach nach Anspruch 13, **dadurch gekennzeichnet, dass** das Halteelement (19) stabartig ist. 40
15. Regalfach nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** zumindest die verformbaren Elemente (6) aus Stahl aufgebaut sind, der mit einem wärmehärtbaren oder wärmeverformbaren Kunststoff überzogen ist. 45
16. Wagen oder Haltevorrichtung, die mit zumindest einem Regalfach nach einem oder mehreren der vorhergehenden Ansprüche versehen ist. 50

Revendications

1. Etagère comprenant une partie de base (2) et au moins un côté (3) relié de manière articulée à ladite partie de base le long d'un bord latéral sensiblement 55

droit, **caractérisée en ce que**, pour permettre au côté (3) d'adopter et de conserver diverses positions par rapport à la partie de base (2), le côté (3) et la partie de base (2) sont jointes de façon rigide l'une à l'autre le long dudit bord latéral par au moins deux éléments déformables semblables à des bandes, la forme des bandes étant telle qu'elle offre un faible moment résistant au pliage entre la partie de base et ledit au moins un côté le long dudit bord, mais offre une grande résistance à toute force exercée transversalement à celle-ci.

2. Etagère **caractérisée en ce que** la partie de base (2) et le côté (3) sont constitués de fils, de tiges ou d'éléments semblables à des tiges métalliques.
3. Etagère **caractérisée en ce que** la partie de base (2) et le côté (3) sont constitués de fils, de tiges ou d'éléments semblables à des tiges non métalliques.
4. Etagère selon la revendication 1, dans laquelle les bandes (6) s'étendent le long de la partie de base (2) et du côté (3) et comprennent une partie intermédiaire déformable.
5. Etagère selon la revendication 1, **caractérisée en ce que** la partie de base (2), le côté (3) et les éléments déformables (6) sont formés de manière à permettre le positionnement du côté parallèlement à la partie de base et en contact avec celle-ci ou dans n'importe quelle autre position angulaire par rapport au bord de ladite partie de base auquel ledit côté est relié.
6. Etagère selon la revendication 1, **caractérisée en ce qu'elle** comprend des éléments d'appui ou d'accrochage (4d ; 15) agencés pour coopérer avec une structure de support (11, 12, 17, 18).
7. Etagère selon la revendication 6, **caractérisée en ce que** les éléments d'appui sont prévus sur la partie de base (2) en tant que crochets (4d) qui forment un angle d'environ 90° avec la partie de base.
8. Etagère selon la revendication 6, **caractérisée en ce que** les éléments d'accrochage (15) sont prévus sur au moins deux côtés (14) positionnés sur deux bords parallèles de l'étagère (2), lesdits éléments d'accrochage étant agencés pour s'accrocher sur une étagère sus-jacente.
9. Etagère selon la revendication 8, **caractérisée en ce que** les éléments d'accrochage (15) comprennent une première partie droite (15A) se terminant par une partie terminale (15B) repliée comme un crochet.
10. Etagère selon la revendication 8, **caractérisée en**

ce que les éléments d'accrochage (15) sont le prolongement de barres d'extrémité (16A, B) limitant latéralement chaque côté (14).

11. Étagère selon la revendication 8, **caractérisée en ce que** la longueur (L) des éléments d'accrochage (15) est telle que, lorsque le côté (14) respectif a été replié sur la partie de base (2), lesdits éléments d'accrochage (15) se trouvent dans ladite partie de base (2). 5
10

12. Étagère selon la revendication 8, **caractérisée en ce que** les éléments d'accrochage (15) se mettent en prise avec un élément semblable à une tige horizontal inférieur (16) des côtés (14) en passant à travers l'espace libre prévu entre les barres d'extrémité (16A, B) du côté et les barres (16C, 16D) immédiatement adjacentes à ces dernières. 15

13. Étagère selon la revendication 8, **caractérisée en ce qu'elle** comprend au moins deux éléments de support (19) pour relier les étagères de manière amovible à une traverse (17), ledit élément de support (19) comportant des parties d'extrémité (20) formées pour coopérer avec les parties terminales (15B) des éléments d'accrochage, et une partie centrale (21) formée pour être placée à califourchon sur ladite traverse. 20
25

14. Étagère selon la revendication 13, **caractérisée en ce que** l'élément de support (19) est semblable à une tige. 30

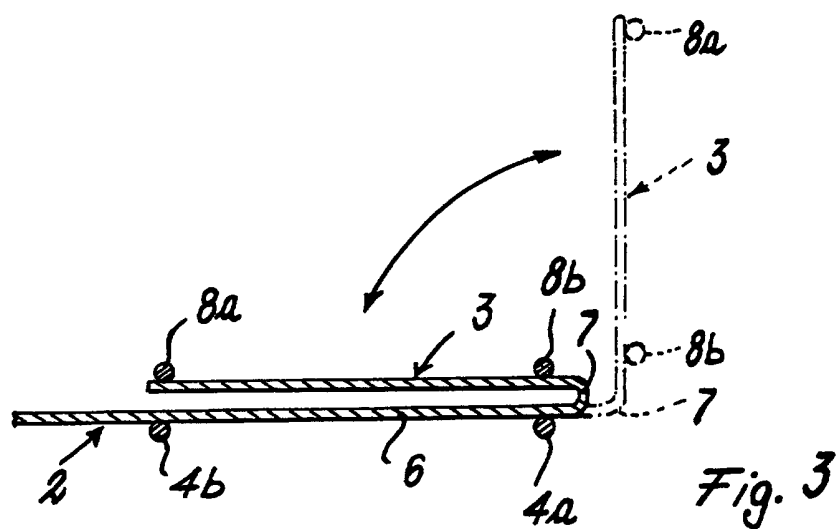
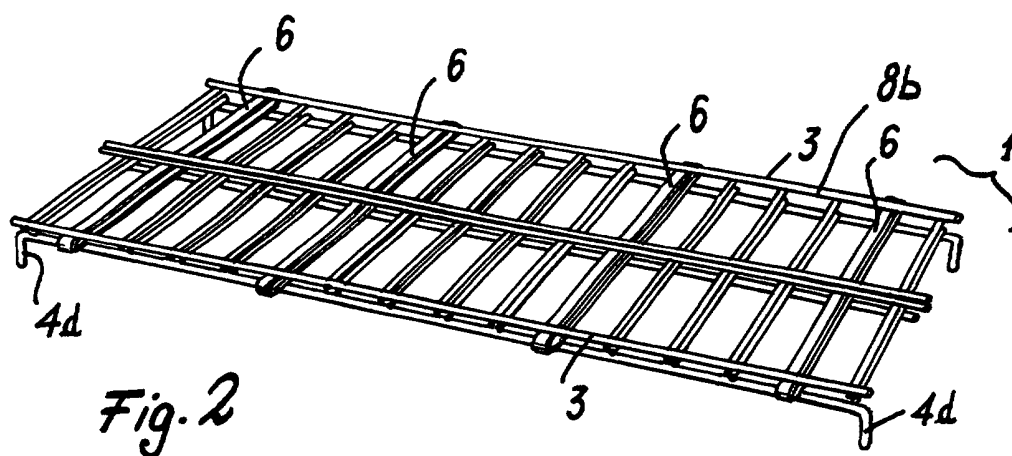
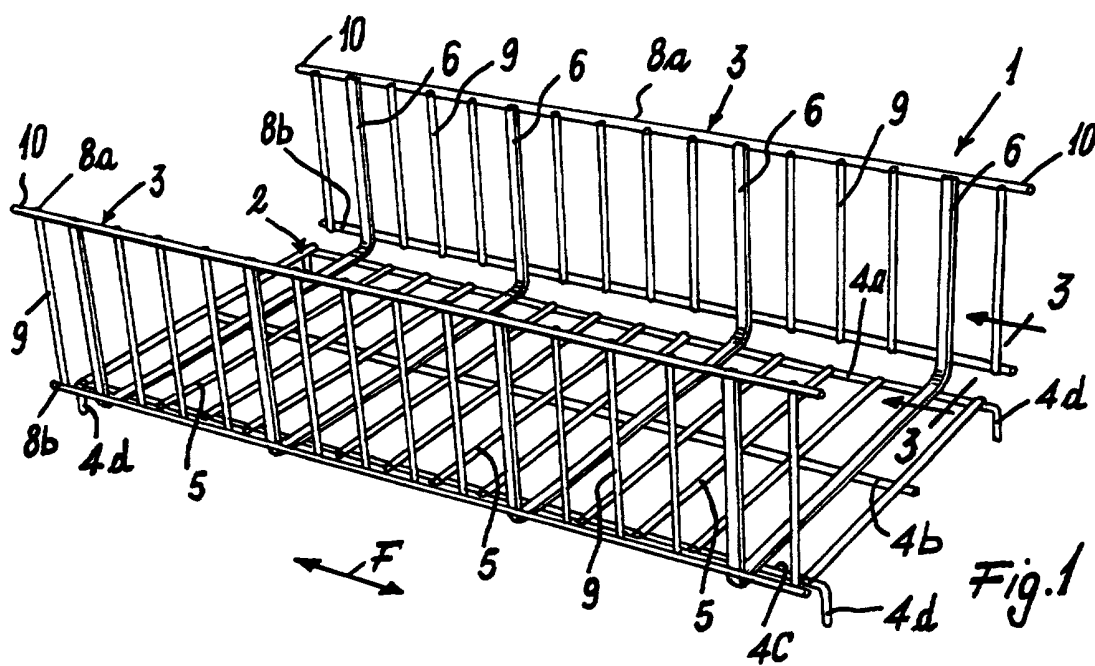
15. Étagère selon l'une des revendications précédentes, **caractérisée en ce qu'au moins** les éléments déformables (6) sont réalisés en acier recouvert d'une matière plastique thermdurcissable ou thermodéformable. 35

16. Chariot ou dispositif de support pourvu d'au moins une étagère selon une ou plusieurs des revendications précédentes. 40

45

50

55



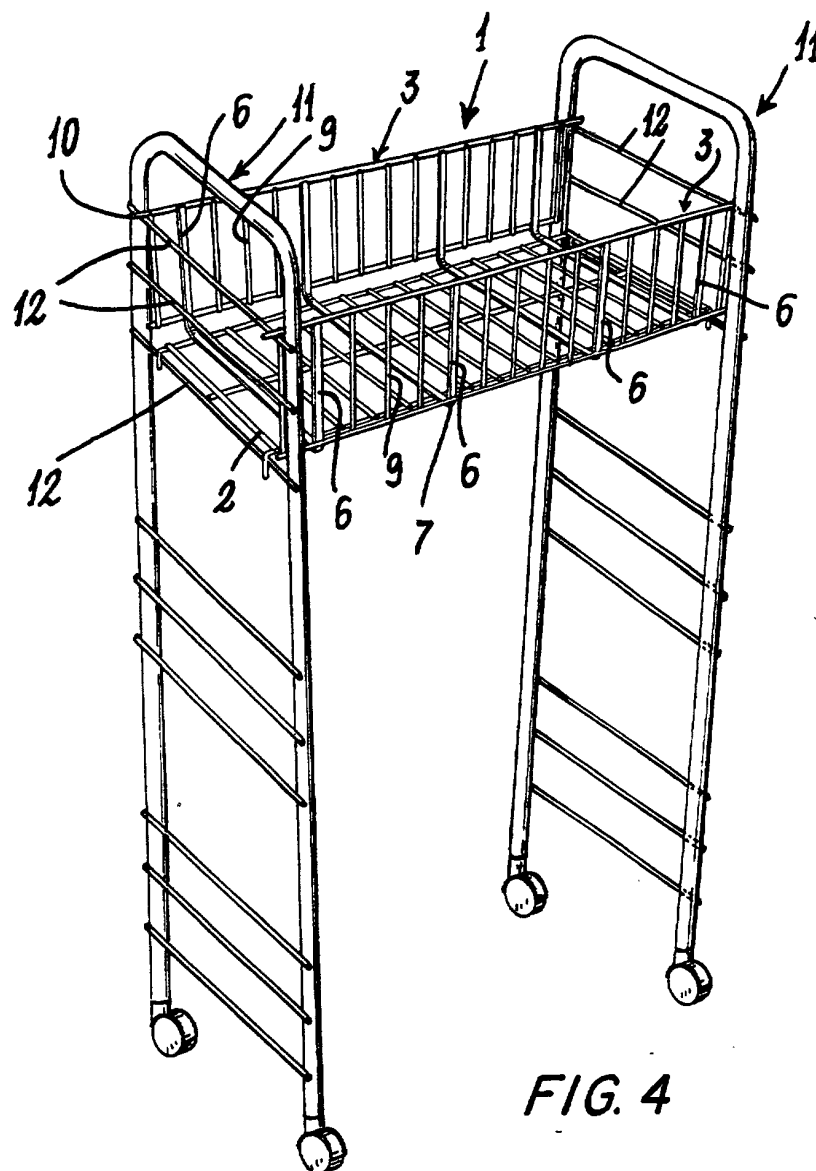


FIG. 4

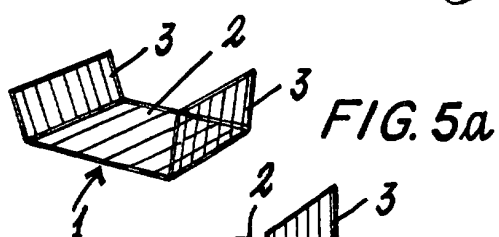


FIG. 5a

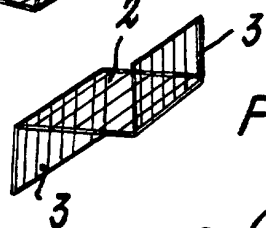


FIG. 5b

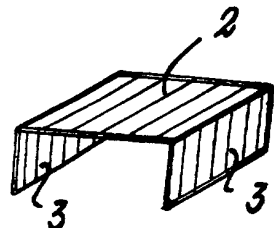


FIG. 5c

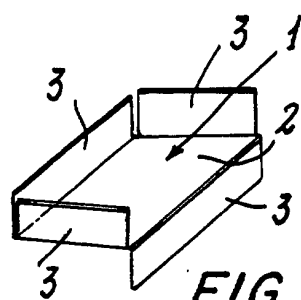


FIG. 5d

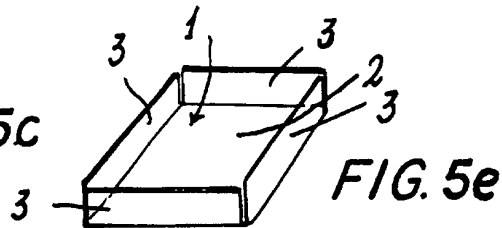


FIG. 5e

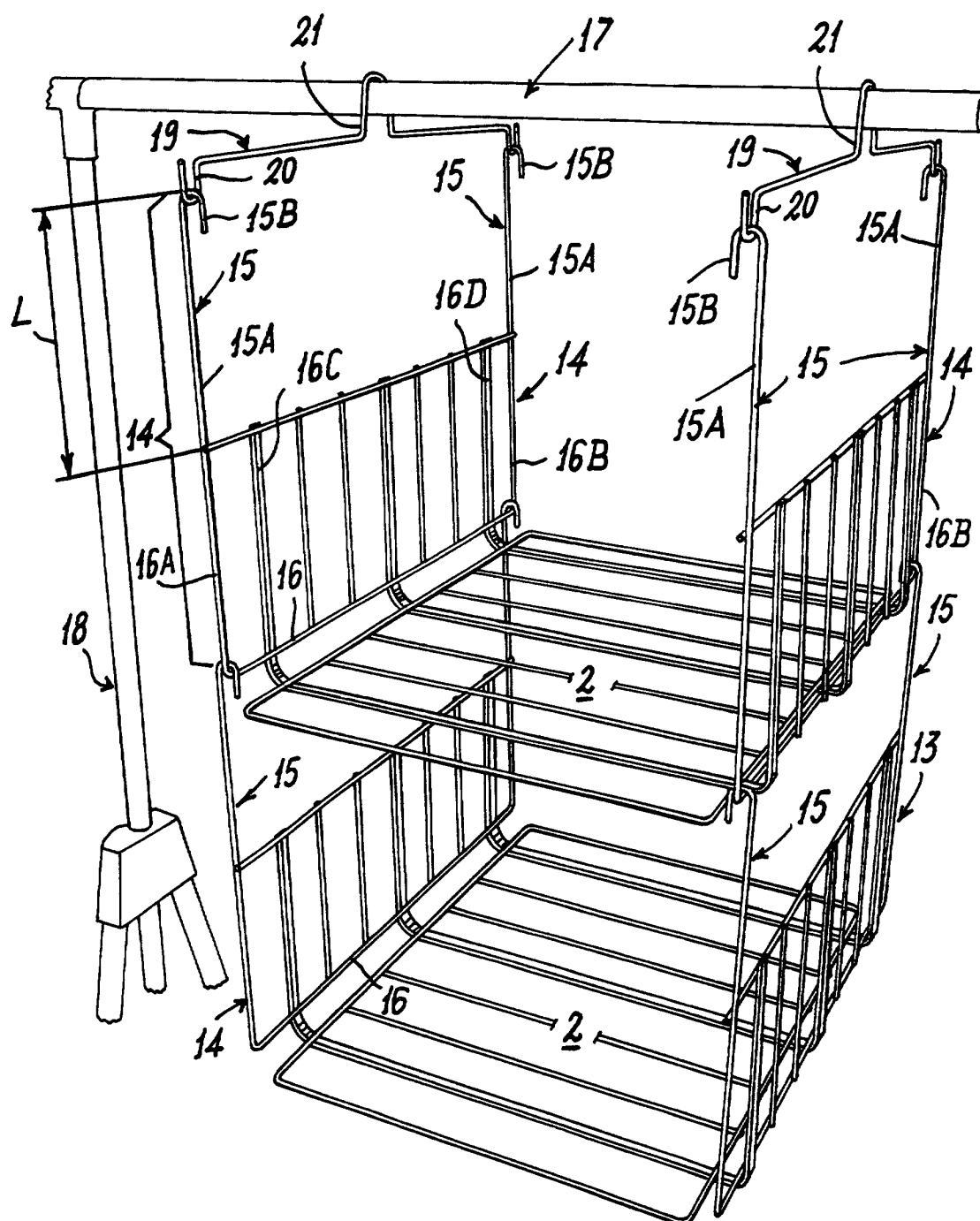


FIG. 6A

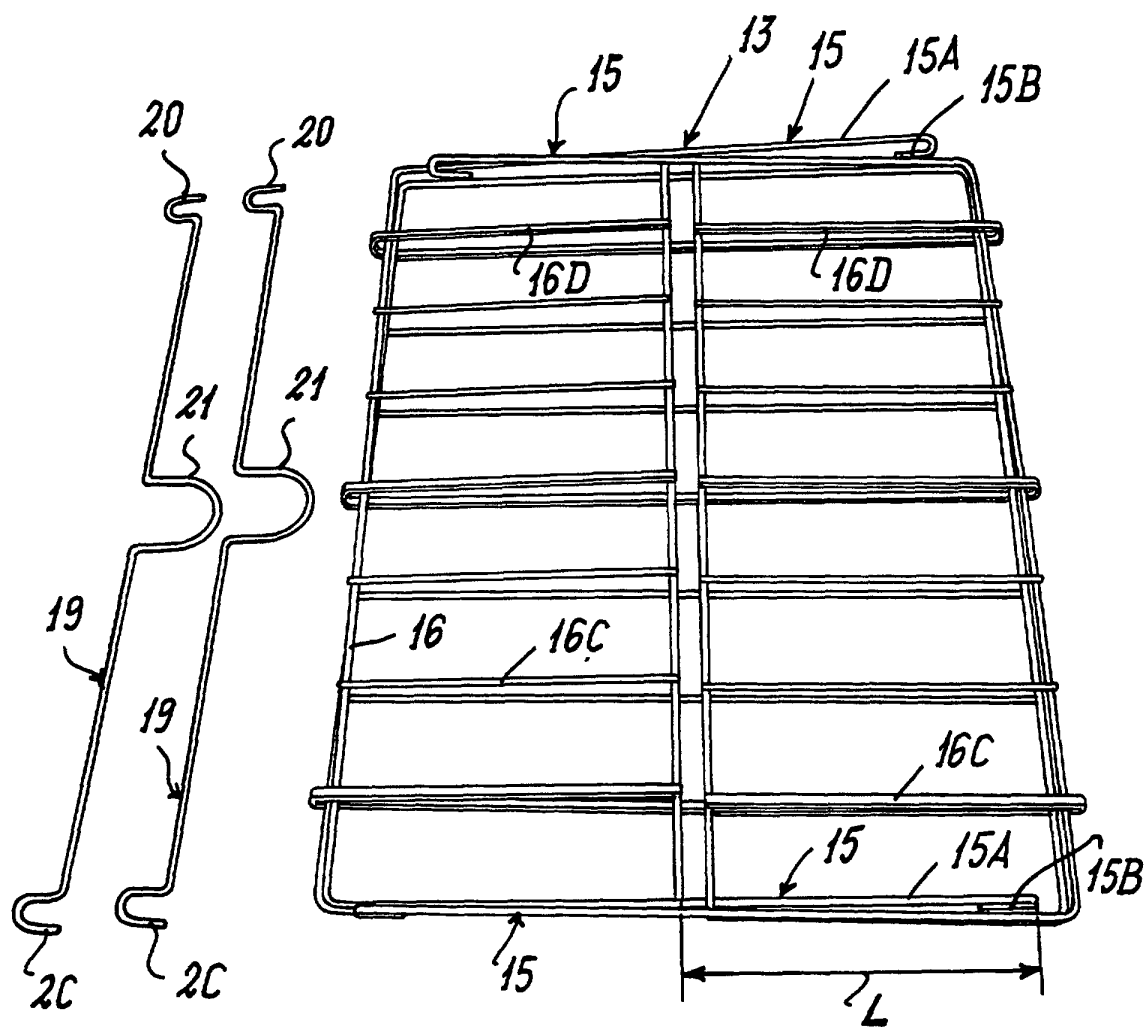


FIG. 6B