July 3, 1962 T. H. E. JAKOBSSON 3,042,220

SHELF STACKS

Filed March 31, 1959 2 Sheets-Sheet 1

Fig. 1

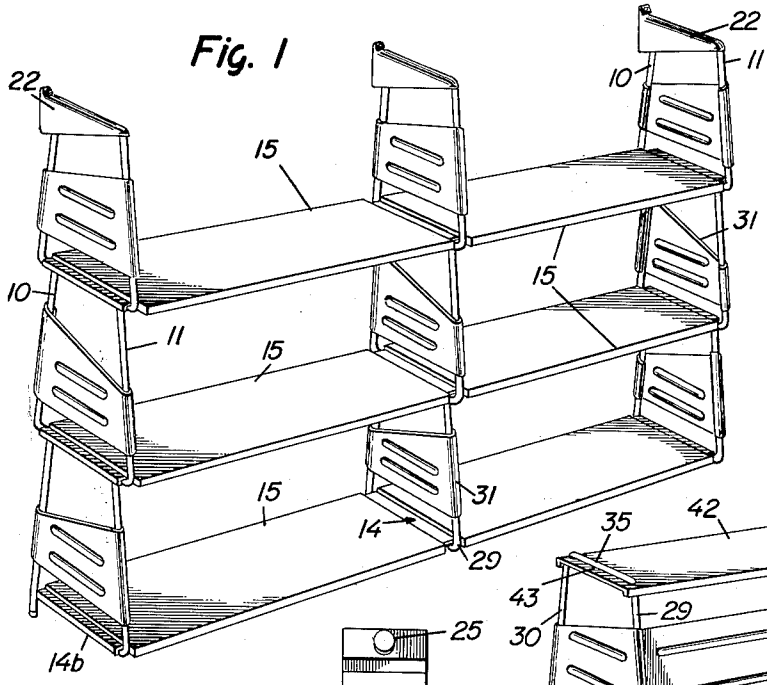


Fig. 7

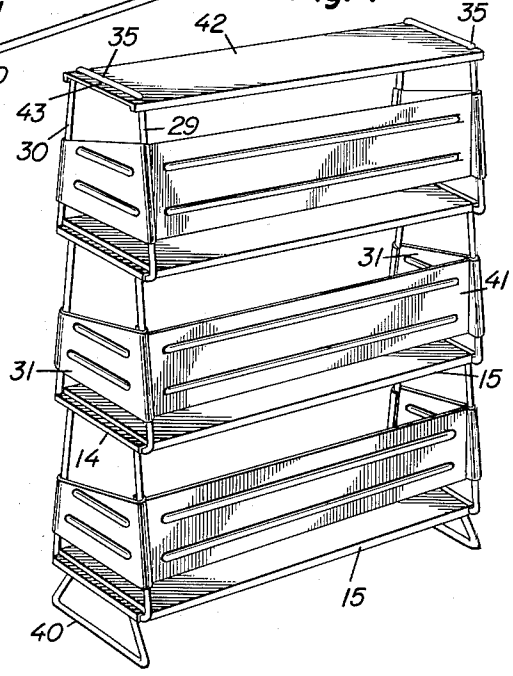


Fig. 3

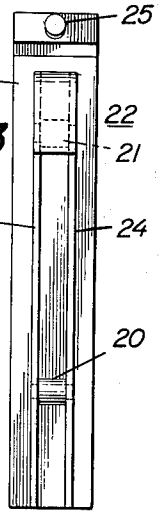
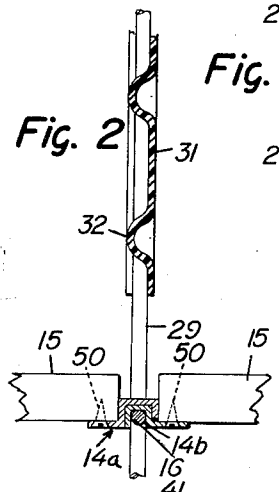


Fig. 2



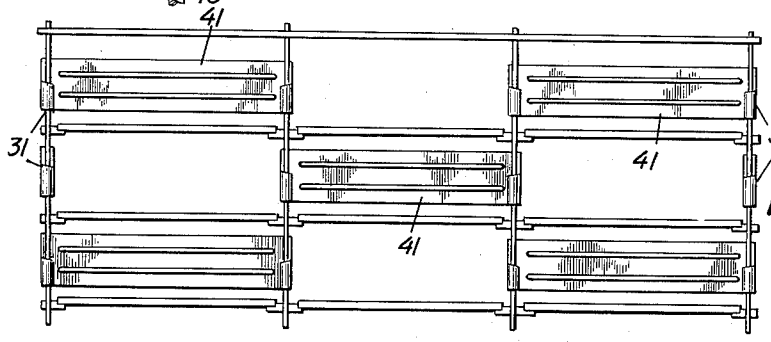


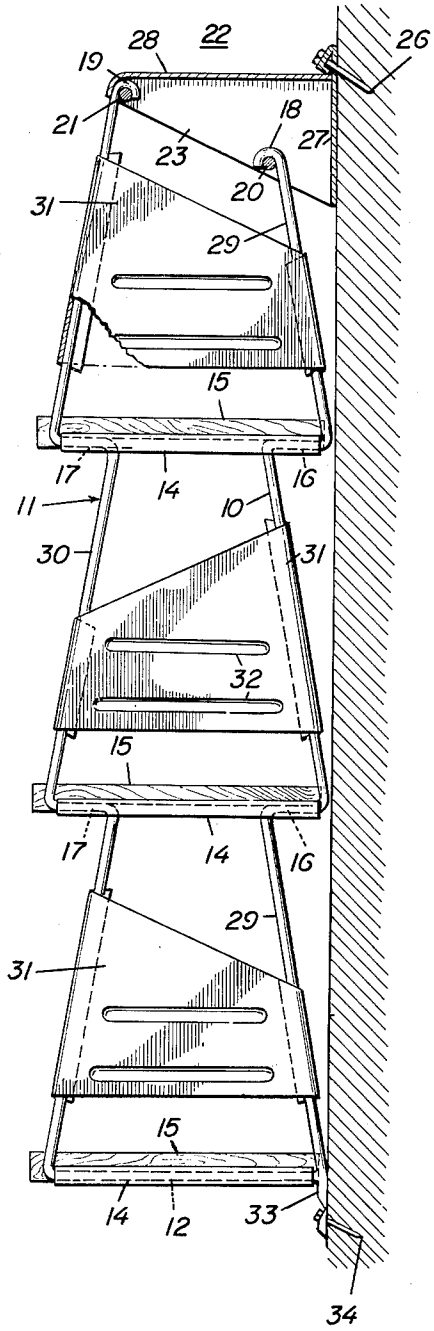
Fig. 8

July 3, 1962 T. H. E. JAKOBSSON 3,042,220

SHELF STACKS

Filed March 31, 1959 2 Sheets-Sheet 2

Fig. 4



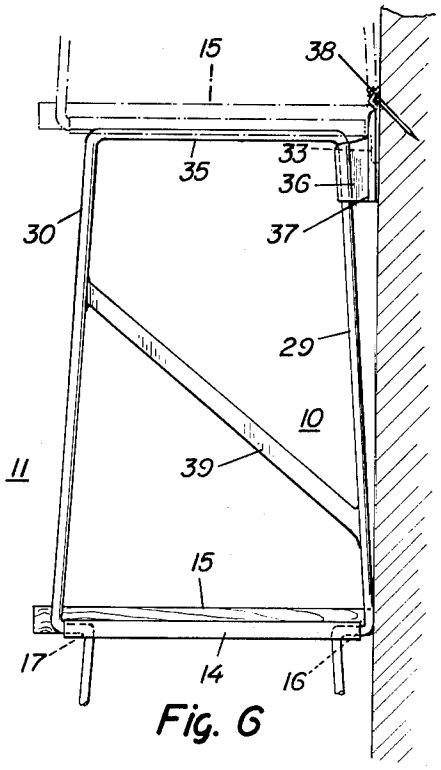


Fig. 6

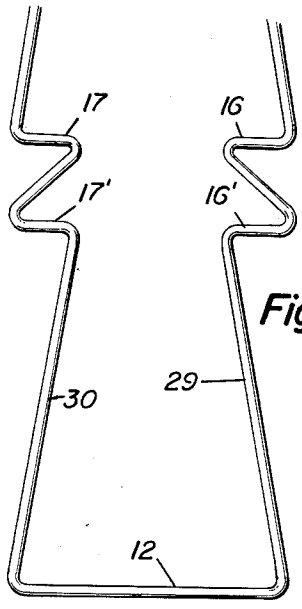


Fig. 5

United States Patent Office 3,042,220 Patented July 3, 1962

3,042,220

SHELF STACKS

Tage Harald Eugén Jakobsson, Herserudsvagen 56, Lidingo, Sweden

Filed Mar. 31, 1959, Ser. No. 803,184
9 Claims. (Cl. 211—148)

The present invention generally relates to shelf stacks, such as bookstacks of the kind comprising detachable upright end members each of which includes two generally vertically extending spaced lengths of rigid wire which support the shelves stacked one above another.

In a previously known bookstack of the kind referred to the shelf supporting elements are constituted by horizontally extending lengths of wire which are secured in between the spaced upright end member wires and on which the shelves are supported by means of hook-like fittings attached to the adjacent ends of the shelves. This shelf stack design suffers from the drawback that the shelves rest loosely on the horizontally extending supporting wires, whereby the shelf may be lifted up from its proper position if one happens to push the shelf from below. In addition, the end members will be expensive to manufacture due to the necessity of welding or otherwise rigidly securing the shelf-supporting cross-wires to the spaced upright wires.

The present invention has for its object to provide a shelf stack which obviates the above-mentioned drawbacks.

For the object stated, a shelf-stack, particularly a bookstack, of the kind referred to is mainly characterized in that the two spaced upright rigid wires of each end member are bent into a saw-tooth-like configuration such as to form, for each shelf position, horizontal supports directed towards each other for supporting hook-fashion cross-sectioned shelf fittings, and, above the respective shelf positions, downwardly diverging wire portions adapted to be embraced by hook-like gripping elements formed integrally with a corresponding end cross piece or brace and adapted to cooperate in a wedge-like manner with said diverging wire portions so as, in a pushed-down position of said cross brace, to urge the wires into abutting engagement with the ends of said shelf fittings, respectively, whereby the shelves are securely anchored to the upright end members of the shelf stack.

Said end cross pieces or braces embracing the spaced upright wires in a wedge-like manner are preferably in the form of plates of sheet-metal, plastic material or the like and are formed with bent-over edge portions to embrace and grip the straight and downwardly diverging portions of the spaced wires of the upright stack end members. It may be convenient in certain cases to interconnect said end cross braces in pairs at their rear edges by a suitably sheet-like back member.

The shelf-stack of the invention offers particular advantages when made in the form of a bookstack. It may be arranged either to be mounted on a wall, or to be supported on a floor or any other supporting base.

The storage shelfstack of the invention can be made to be extendible in a kit-like manner both horizontally and vertically. In this instance, when constructed for mounting on walls, the wall fastening means for a lower shelf-stack may suitably be formed as lateral guide members for the upright end members forming part of a shelf-stack mounted at a higher level.

A shelf-stack constructed in accordance with the invention is very sturdy in its assembled condition and has a very attractive appearance.

The invention will now be described in greater detail in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of a double bookstack according to the invention and adapted to be mounted on a wall;

FIG. 2, on a larger scale, is a fragmentary vertical sectional elevation;

FIG. 3, also on a larger scale, shows a suspension bracket in front elevation;

FIG. 4 is an enlarged side elevation of the bookstack shown in FIG. 1, and illustrating the suspension bracket in vertical section;

FIG. 5 shows a modified form of end member;

FIG. 6 is a fractional side elevation showing two associated bookstacks suspended on a wall, one above the other;

FIG. 7 is a perspective rear view of a bookstack to be supported on a floor, and

FIG. 8 is a front elevation of three floor-supported bookstacks assembled into a unitary structure.

Referring to the drawings, each shelf stack end member, as is shown particularly clearly in FIG. 4, is composed of two spaced upright, heavy-gage lengths of steel-wire, **10** and **11**, which are interconnected at their bottom ends by a straight horizontal portion **12** serving as a supporting element for a hook-sectioned end fitting **14** on the lowermost shelf **15**. The inwardly bent portions **16** and **17** of the wires form horizontal supports for the end fittings **14** of the intermediate and uppermost shelves **15**. The top-end portions **18** and **19** of the wires **10** and **11** are bent over in a hook-like fashion and engage pins **20** and **21**, respectively, which are secured in between the two cheek plates **23**, **24** of the bracket **22**, said cheek plates being substantially triangular and disposed in spaced parallel interrelation. These bracket cheek plates are welded to a supporting plate **27** adapted to engage the wall and provided with a hole **25** for a fastening element **26**. The bracket cheek plates **23** and **24** are interconnected at their top edges by a cover plate **28**. The wire lengths **10** and **11** are formed above shelf supporting portions **12** and **16**, **17**, respectively, with rectilinear portions **29** and **30**, respectively, which diverge downwardly towards the shelf supporting portions. Said downwardly diverging wire portions are embraced in a wedge-like manner by bent-over edge portions of end cross braces **31** which are adapted in their pushed-down position to urge the opposed wire portions at the angle between the horizontal shelf-supporting portions and the downwardly diverging straight wire portions against the adjacent ends of the end fitting **14** concerned, whereby these end fittings serve as spacing elements, the shelves **15** being thus rigidly secured in place. The wedging cross braces **31**, being suitably in the form of plates of sheet-metal, plastic material or the like formed with bent-over end-edges, will also serve to oppose any tendency of the wires **10** and **11** to straighten out due to the load from the shelves.

In order to enable the end cross plates **31** efficiently to serve as lateral supports for both ends of the row of books, they are formed with embossments **32** which form on one face of the plate ridges which lie flush with the bent-over edge portions, whereby the adjacent book may bear on these bent-over portions as well on said ridges.

The shelf-end fittings generally designated by the numeral **14**, as will appear from FIG. 2, are formed in a manner to enable the fitting **14***a* at one end of a shelf to grip over the underlying end fitting **14***b* of the opposite end of the adjacent shelf, if any. Fittings **14***a* and **14***b* are of inverted U-shape and are preferably secured to shelf **15** by means of screws **50**.

To prevent sidewise oscillation of the wall-bookstack, there is provided at the bottom end of each upright wire end member an extension **33** having an elongated opening or slot for passing a nail **34** or any other fastening element.

If it is desirable to enable the shelf spacings to be changed, then the wire lengths **10** and **11** may be bent into the configuration illustrated in FIG. 5 so that horizontal

shelf supports 16, 17 and 16', 17' are provided at slightly different levels.

In the wall-suspension bookstack of FIG. 6, the two spaced upright and saw-tooth-shaped wire lengths 10 and 11 of the stack-end members are interconnected at their top ends by a crosswise extending wire portion 35. The wall mounting member 36 from which the stack-end member is suspended embraces in a sleeve-like manner the wire portion 29 immediately beneath the horizontally extending wire portion 35. Adjacent the wall, the mounting member 36 forms a sleeve-like guiding element 37 in which the downward extension 33 of a shelf stack disposed at a higher level may be received. The mounting member 36 is fastened to the wall by means of two nails 38 which are driven on either sides of the rear wire of the upper upright end member. An inclined cross brace 39 is provided for stiffening the stack-end member.

In the floor-supported bookstack of FIG. 7, the stack end members have their bottom cross portions formed into legs 40 serving for supporting the composed shelf stack on a floor. The plate-like end cross braces 31 are interconnected in pairs at their rear edge by a sheet-like back member 41 forming a rear support for the books and also imparting the necessary lateral stiffness to the composed bookstack. As shown in the drawing, the back member and end cross braces are formed integrally by bending one single sheet member. The topmost shelf 42 is formed near each end with a transverse slot 43. By means of these slots the shelf 42 is received on the top end portions of the respective stack end members with the end edges of the slots supported on the downwardly diverging wire portions 29 and 30.

FIG. 8 illustrates the composition of a treble shelf-stack with three shelves. The upright stack-end members 31 are interconnected in pairs by back members 41. Simple end cross bracing plates 31 are mounted at the middle of the length of the outermost stack end members.

What I claim is:

1. A shelf stack, comprising shelves and detachable upright end members each including two generally vertically extending spaced lengths of rigid wire which support the shelves stacked one above another, characterized in that the two spaced upright rigid wires of each end member are bent into a saw-tooth-like configuration such as to form, corresponding to each shelf position, horizontal supports directed towards each other for supporting hook sectioned shelf fittings, each said wire having downwardly diverging wire portions which are embraced by hook-like gripping elements formed integrally with a corresponding end cross piece and adapted to cooperate in a wedge-like manner with said diverging wire portions so as, in a pushed-down position of said cross brace, to urge the wires into abutting engagement with the ends of said shelf fittings, respectively, whereby the shelves are securely anchored to the upright end members of the shelf stack.

2. A shelf stack according to claim 1, characterized in that the end cross pieces embracing the spaced upright wires in a wedge-like manner are in the form of plates and are formed with bent-over edge portions to embrace and grip the downwardly diverging portions of the spaced wires of the uprigtht stack end members.

3. A shelf stack according to claim 2, characterized in that said cross bracing plates are formed with one or more embossments which form surfaces flush with the bent-over edge portions for laterally supporting books or the like placed on the respective shelf.

4. A shelf stack according to claim 2, characterized in that the said cross bracing plates are interconnected in pairs at their rear edges by means of a back member composed of sheet-material.

5. A shelf stack according to claim 1, characterized in that the two spaced upright lengths of wire of each stack end member are constituted by the upwardly directed branches of one single length of wire bent into hairpin-configuration.

6. A shelf stack according to claim 5, characterized in that the two spaced upright lengths of wire of each stack end member are interconnected, in addition, at their top ends by a crosswise extending wire portion.

7. A shelf stack according to claim 1, characterized in that the spaced wire lengths of each stack end member are bent correspondingly into configurations such as to provide, in respect of one shelf, at least, two or more supports disposed at different levels to enable the shelf to be placed selectively on one or another of said supports.

8. A shelf stack according to claim 1 and adapted to be supported on a floor or other supporting base, characterized in that a crosswise extending wire portion interconnecting the bottom ends of the spaced upright stack end member wires is formed into a supporting foot for the corresponding shelf stack end member.

9. A shelf stack according to claim 8, characterized in that the topmost shelf is formed with crosswise extending slots by which the shelf is received on the top-end portions of the stack end members, respectively, with the end edges of said slots bearing against the downwardly diverging wire portions, respectively.

References Cited in the file of this patent

UNITED STATES PATENTS

2,315,595	Chappory	Apr. 6, 1943
2,328,910	King	Sept. 7, 1943
2,657,810	Garrick	Nov. 3, 1953
2,738,883	Wineman	Mar. 20, 1956
2,741,370	Dills	Apr. 10, 1956
2,848,119	Fitser	Aug. 19, 1958
2,869,731	Axelrod	Jan. 20, 1959