

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO RACKS FOR SUPPORTING AND DISPLAYING ARTICLES

(71) We, FORS & FORSS AB, a company duly organized and existing under the laws of Sweden, of Duvedsvägen 17, 162 23 Vällingby, Sweden, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The present invention relates to a rack supporting and displaying articles e.g. goods and/or sales packages of substantially parallelepipedic shape.

15 Sales and display racks are known in many forms. For goods which are, despite their small size per unit, of a relatively high cost, attempts have long been made to find a solution to the problem of displaying the goods in an attractive manner and simultaneously preventing unauthorised removal of them. The prior art constructions are complex and may possess shortcomings both as regards handling and function.

20 The present invention provides a rack for supporting and displaying one or more articles and comprising, for each article, barriers defining a storage location, the barriers being placed at the top, bottom, sides, front and back of the location, the
25 bottom barrier comprising a support disposed at the back of the location, the front barrier comprising a lower fixed barrier and an upper movable barrier, the movable barrier being movable between a first position for retaining an article in the location
30 and an outwardly displaced second position, whereby, when a suitable article is in the location, it is retained by the barrier when the movable barrier is in the first position
35 but tilts forward pivoting on the said support and may be withdrawn upwardly and forwardly between the top barrier and the movable barrier when the movable barrier is in the second position.

40 Preferably, the bottom of each storage

location is defined by a shelf member bearing along its rear edge the said support and having the lower front barrier extending upwardly from its front edge.

Preferably, the said support is a ridge 50 extending along the rear edge of the shelf.

The rack may comprise a frame having therein a plurality of vertically spaced storage locations as defined above, and further comprising means connected to all of 55 the movable barriers of the storage locations for simultaneously controlling the movement of these barriers.

It is preferred that the or each said movable barrier comprises a bar member 60 extending across the front of the storage location.

It is also preferred that the frame around the storage locations has opposite vertical side-pieces having therein a vertically movable rod coupled to each movable barrier in the frame, each movable barrier being a crank whose ends are coupled to respective vertical rods and whose offset intermediate portion constitutes the said bar member. 70

In such a case there may be provided a shaft extending through a top member of said frame, and a pair of levers fixed to opposite ends of said shaft, each said lever being pivoted to a respective one of said 75 rods, whereby rotation of the shaft lifts and lowers the rods.

Preferably, at least one of said rods has extending upwardly from the top thereof a stud member adapted to extend through and 80 above said frame for cooperation with an external locking mechanism.

Preferably, such a rack comprises a plurality of said frames each pivoted about one side-piece thereof to a support member, 85 each said frame having extending therefrom a stud member, all of said stud members being adapted for cooperation with a single external locking mechanism.

The invention includes a rack as de- 90

scribed above containing an article or articles in the storage locations. The article may be a boxed tape cassette.

The nature of the present invention will be more fully understood from the following description of preferred specific racks with reference to the drawings, and discussions relating thereto.

In the accompanying drawings:

10 Fig. 1 shows an embodiment of the invention intended for mounting to a wall or the like and being particularly adapted for tape cassettes;

15 Fig. 2 shows an embodiment intended for similar purposes supported on a column;

Fig. 3 is, on a larger scale, a front elevation of the frames included in the rack;

Fig. 4 is a vertical section of the frame of Fig. 3;

20 Fig. 5 shows a detail of Fig. 4 and illustrates the movement of the locking fork;

Fig. 6 is a front elevation of a locking rail included in the frame;

Fig. 7 shows the same rail from the side;

25 Fig. 8 is a vertical section of the wall mounting;

Fig. 9 is a perspective view of one end portion of the upper section of the wall mounting;

30 Fig. 10 shows a detail of the underside of the upper section of the wall mounting;

Fig. 11 is a vertical section of the upper mounting for a so-called "roundabout" rack;

35 Fig. 12 is a horizontal section through the same mounting; and

Fig. 13 shows a locking arm included in the lock.

A rack consists of a number of frames 1 provided with shelves and intended for supporting goods, the frames being provided with their intended stands. The stands may consist of a straight rail device 2 which can be mounted on a wall or a so-called column mounting 3. In both cases, the frames 1 can be pivoted in one or the other direction.

Each one of the frames 1 consists of an inner and outer side-piece 4 and 5, respectively and a top and bottom piece 6 and 7, respectively. The desired number of shelves 8 is mounted between the side-pieces 4 and 5, the goods (in this case the cassettes) being intended to be placed between these side-pieces and the top and bottom pieces 4, 5, 6 and 7. The shelves 8 and the bottom piece 7 are provided, on their upper sides with two upwardly projecting flanges or projections 9 and 10, respectively and have, like the top piece 6, a flange 11 on the underside. The vertical distance between the shelves is such that a goods box can be inserted into the space between the shelves in that the lower edge portion of the box is inserted between the flanges 9 and 10 and 65 its upper edge portion is pivoted under the

superjacent shelf. On the other hand, the distance between the opposing flanges 9 and 11 is less than the height of the goods.

As is apparent from Fig. 4, the bottom of the shelves between the flanges 9 and 10 is provided with a ridge 12 disposed along the rear edge. The ridge is of such transverse extent and shape that a box resting against the ridge and placed against the depending flange 11 of the superjacent shelf will, as soon as it is released, automatically draw away from the flange 11 and swing outwardly.

As is most clearly apparent from Fig. 3, 4 and 5, a shiftable abutment in the form of a fork 13 is provided for, in its one position, retaining the box in a position parallel with the frame and, in its other position, allowing the box to pivot forwardly for making possible the removal or insertion of boxes. Fig. 4 illustrates, by means of broken lines, how a box X will automatically assume an outwardly sloping position which permits removal of the box obliquely upwardly when the fork 13 is in its outwardly pivoted position.

Operation of all of the locking forks 13 on one frame 1 is effected centrally by means of a handle 14 disposed at the outer upper corner of the frame 1. The handle 14 is fixed to a square shaft 15 which is mounted in a groove 17 running along the top piece 6.

A guide 18 for a rod 19 is disposed in each respective side-piece 4 and 5 between inner and outer strips which may suitably be snapped together. Only the rod located at the outer edge is shown on the drawings. A similar rod is to be found at the inner edge, this rod being moreover extended at the top by means of a projection 20 (marked by broken lines in Fig. 6 and 7). This projection will be discussed later. A pin is fixed to each rod 19, the pin being connected to an arm 22 which is rigidly connected to the shaft 15 operable by means of the handle 14. In order to ensure smooth movement between the position shown in Fig. 7 by solid lines and the position intimated by means of broken lines, the hole 23 in the arm, in which the pin 21 is inserted, is elongated.

Furthermore, there is provided, in each rod 19, a number of holes 24 corresponding to the number of shelves and forks 13, in which holes the bent end prongs 25 of the forks 13 are inserted.

The transversely bent end portions 26 of the forks are, on mounting of the frame, inserted through holes 27 in the front sides of the hollow frame side-pieces 4 and 5. Moreover, the rods 19 are forced onto the end prongs 25 of the forks before the outer, substantially U-shaped, strips 29 of the frame side-pieces are snapped together.

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The holes 27 serve as guides for the portions 26 of the forks 13. When the arm, by turning of the handle 14, is turned, the rods 19 will be lifted or lowered. Since the portions 26 of the forks 13 will, as is most clearly apparent from Fig. 5, slide towards and be guided by the edges of the holes 27, the longitudinal center portion of the forks 13 forming a support abutment for boxes placed in the shelves will effect an outward/downward and upward/inward movement, respectively. Because the boxes bear against the ridge 12 only at the distal edge of the bottom of the shelves 8 as seen from the forks, the natural weight of the boxes will entail that they follow the movements of the forks 13. Thus, when the rods 19 are lifted, the boxes will pivot forwardly to the position shown in Fig. 4 by means of broken lines; and, when the rods are lowered, the boxes will pivot inwardly so as to come into a plane with the frame 1 and the forward edges of the shelves.

As is apparent from Figs. 1 and 2, the frames 1 form a complete rack together with the stands. In Figs. 8 and 9 is shown a straight stand which may serve as a wall mounting 2 and consists of an upper portion 30 and a lower portion 31 which in turn are fixed to rails. Journal holes 32, 33 are provided in both the upper portion and the lower portion for shafts 35 disposed in guides 34 at the rear edge 4 of the frames 1. In order that the frames 1 be able to assume a determined position, that is to say, either pivoted inwardly in one direction towards the wall supporting the mounting 2 or pivoted outwardly, the holes 32 and 33 are mutually offset so that the vertical line from the upper hole 32 will strike a point located by the side of and outside the lower hole 33.

Mention has previously been made of the fact that the rods 19 acting upon the forks 13 are provided, at the inner edge of the frames, with a projection 20. This follows the movement of the rods and, hence, as is apparent, for example, from Fig. 3, rises above the upper edge of the frame when the locking forks are in the open position.

A movable locking flap 36 is disposed at the upper portion 30 of the wall mounting and forms a locking mechanism together with the above-mentioned rod projection 20. As is apparent from Fig. 10, an arcuate slot 37 is provided in the upper portion 30 of the wall mounting adjacent each journal hole 33. When the forks 13 are in the open position the rod projections 20 can project through these slots without preventing the pivoting movement of the frames 1. The locking flap 36 journalled at its one edge is quite simply lifted up by the projections 20 when these project up through the slits 37. If the rack is to be locked, a key inser-

ted in a lock 38 can be turned, thereby turning a locking arm 39 so that the locking flap 36 is pivoted downwardly, whereupon it will depress the upwardly projecting projections 20 which act upon the forks 13 and lock the rack. Naturally, it is also possible first to see to it that all of the handles 14 are in the closing position and thereafter lock the locking flap 36 by means of the key. In the lowered position, the locking flap prevents upward shifting of the rods 19 and thereby pivoting of the forks 13 to open position.

In the embodiment according to Figs. 11 and 12, this embodiment being intended for use with so-called "roundabout" stands, there is also provided an upper and lower portion provided with journal holes for the shafts 35 of the frames. Only the upper portion 40 provided with the journal holes 33' is shown on the drawing. The lower portion consists of a disk fixedly mounted to the stand column 41 and provided with similar holes.

In the embodiment according to Figs. 11 and 12, the upper portion 40 is shiftable relative to the column 41 supporting it and the lower disk. The cap-like upper portion 40 surrounds a locking arm 43 which co-operates with a pin 42 fixed to the column 41 and is actuable by means of a key. In the locked position the portion 40 assumes the position shown on the drawing and when the lock is released, the portion 40 is shifted by means of the spring 44 upwardly until its bottom (provided with the journal holes 33') engages with a fixed abutment 45.

In the locked, downwardly shifted position, the distance between the underside of the portion 40 and the upper edge of the frames 41 is so small that the rods 19 with the projection 20 cannot be shifted upwardly and release the forks 13. When, on the other hand, the portion 40 has been shifted upwardly (the journal holes 33' being shifted along the shafts 35), the distance is so large that the rod projections 20 can easily be shifted upwardly and the locking forks 13 of the frames 1 can be opened.

It is obvious that several modifications are possible as regards the design of the locking forks, the mechanism for their operation and the central locking mechanism. It is also obvious that the frames included in the rack may be provided in many different variations both as regards shelf division and dimensional proportions. This disclosure relates only to one field of use but it is obvious that the rack according to the invention may be used within many fields in conjunction with goods types for which use is made of boxes or packages of a suitable type.

The invention should not be considered as restricted to that described above and shown on the drawings, many modifications being possible within the scope of the appended claims.

WHAT WE CLAIM IS:—

1. A rack for supporting and displaying one or more articles and comprising, for each article, barriers defining a storage location, the barriers being placed at the top, bottom, sides, front and back of the location, the bottom barrier comprising a support disposed at the back of the location, the front barrier comprising a lower fixed barrier and an upper movable barrier, the movable barrier being movable between a first position for retaining an article in the location and an outwardly displaced second position, whereby, when a suitable article is in the location, it is retained by the barriers when the movable barrier is in the first position but tilts forward pivoting on the said support and may be withdrawn upwardly and forwardly between the top barrier and the movable barrier when the movable barrier is in the second position.

2. A rack as claimed in claim 1, wherein the bottom of each storage location is defined by a shelf member bearing along its rear edge the said support and having the lower front barrier extending upwardly from its front edge.

3. A rack as claimed in claim 2, wherein the said support is a ridge extending along the rear edge of the shelf.

4. A rack as claimed in any preceding claim, comprising a frame having therein a plurality of vertically spaced storage locations, as defined in claim 1, and further comprising means connected to all of the movable barriers of the storage locations for simultaneously controlling the movement of these barriers.

5. A rack as claimed in any preceding claim, wherein the or each said movable barrier comprises a bar member extending across the front of the storage location.

6. A rack as claimed in claim 5, wherein the frame around the storage locations has opposite vertical side-pieces each having therein a vertically movable rod, coupled to each movable barrier in the frame, each movable barrier being a crank whose ends are coupled to respective vertical rods and whose offset intermediate portion constitutes the said bar member.

7. A rack as claimed in claim 6, further comprising a shaft extending through a top member of said frame, and a pair of levers fixed to opposite ends of said shaft, each said lever being pivoted to a respective one of said rods, whereby rotation of the shaft lifts and lowers the rods.

8. A rack as claimed in claim 7, wherein at least one of said rods has extending upwardly from the top thereof a stud member adapted to extend through and above said frame for cooperation with an external locking mechanism.

9. A rack as claimed in claim 8, comprising a plurality of said frames each pivoted about one side-piece thereof to a support member, each said frame having extending therefrom a stud member, all of said stud members being adapted for cooperation with a single external locking mechanism.

10. A rack substantially as hereinbefore described with reference to and as illustrated in Fig. 1 or Figs. 2 to 13.

11. A rack as claimed in any preceding claim, and containing in one or more storage locations an article having substantially the same dimension as the storage location.

12. A rack as claimed in claim 11, wherein the or each article is a boxed tape cassette.

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2. A rack as claimed in claim 1, wherein the bottom of each storage location is defined by a shelf member bearing along its rear edge the said support and having the lower front barrier extending upwardly from its front edge.
3. A rack as claimed in claim 2, wherein the said support is a ridge extending along the rear edge of the shelf.
4. A rack as claimed in any preceding claim, comprising a frame having therein a plurality of vertically spaced storage locations, as defined in claim 1, and further comprising means connected to all of the movable barriers of the storage locations for simultaneously controlling the movement of these barriers.
5. A rack as claimed in any preceding claim, wherein the or each said movable barrier comprises a bar member extending across the front of the storage location.

6. A rack as claimed in claim 5, wherein the frame around the storage locations has opposite vertical side-pieces each having therein a vertically movable rod, coupled to each movable barrier in the frame, each movable barrier being a crank whose ends are coupled to respective vertical rods and whose offset intermediate portion constitutes the said bar member.

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