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STORAGE RACK FOR CONTROL PANELS

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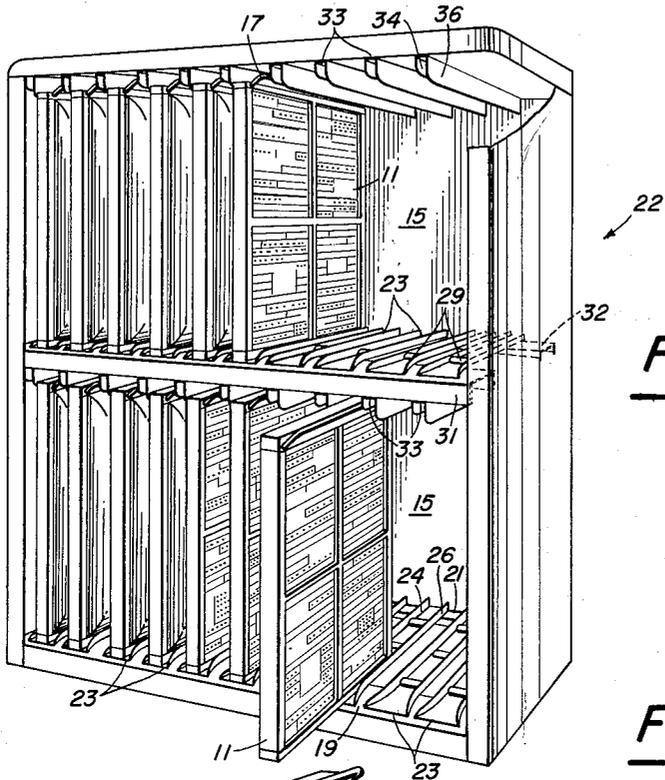


Fig. 1

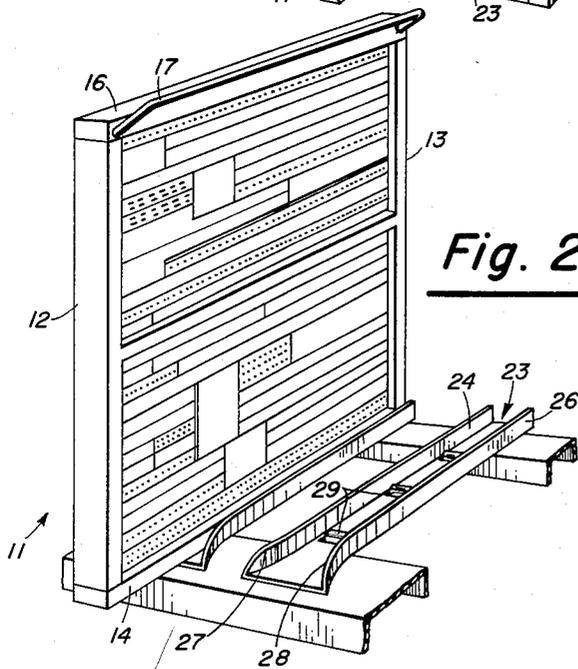


Fig. 2

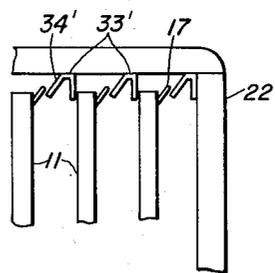


Fig. 3

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STORAGE RACK FOR CONTROL PANELS

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(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

The present invention relates to a cabinet or rack for storing control panels, particularly of the type having handle portions extending obliquely outwardly along one side of the panel, such, for example, as the panels used in IBM No. 407.

Generally, the previous rack and panel arrangement was such that the panels were stored in a flat or horizontal position so that the obliquely-extending handle portion faced outwardly to provide for the operator a handhold by means of which he could manipulate the panels as they were removed from the rack and transported to the machine. In other storage arrangements panels of similar type were stored on end with the handle portion extending outwardly and disposed in a vertical plane.

In either of the above-noted arrangements considerable difficulty was experienced and time lost in transferring the panels from an in-rack to an in-machine position and in the reverse operation. This was due to the fact that the panels when in storage were not positioned in the same way as when they were when in the machine. As a result the operator sometime during making the transfer must change his grasp and rotate the panel at least 90 degrees in order to place it into the machine.

These panels are relatively heavy and since the operators for the most part are women the matter of their handling is of cardinal importance.

Another difficulty frequently experienced is that the panels are often difficult to move into and out of the racks and frequently bind in the racks with resulting damage both to racks and panels and attendant loss of time and effort.

According to the invention a storage rack or cabinet for control panels of the type identified above is provided in which the panels are stored in an upright position with the panel handle freely available to the extent that the operator can in a single motion and without shifting his grip withdraw the panel and insert it into the machine. This result is enabled by the specific configuration of the vertically-disposed guideways into which the panels slide for storage. Although this configuration subsequently will be described in detail it is characterized by the fact that it is adapted to receive the handle of the panel in the same relative position as that in which the handle is disposed in the machine. Also the support for the panel which holds the panel in an upright position in the rack is formed by bearing surfaces abutting the handle as well as the side portions of the panel.

A feature of the invention is the provision of relatively frictionless paths along the bottom of the guideways, through use of rollers or ball bearings, which enable the panels to slide into or out of the racks with a minimum of effort and time required of the operator.

An object of the present invention is the provision of a storage rack or cabinet for control panels of the type

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identified above which requires a minimum of time and effort in shifting the panels from in-storage to in-machine position and vice versa.

Another object is to provide a storage rack or cabinet for control panels in which the panels require no shifting of handholds as they are carried between in-machine and in-rack positions.

A further object of the invention is the provision of a storage rack for control panels which requires a minimum of effort for inserting or extracting the panels.

Still another object is to provide a storage rack for control panels which minimizes possible damage to rack and panels.

Other objects and many of the attendant advantages of this invention will become apparent upon consideration of the detailed description in conjunction with the accompanying drawing in which like reference numerals designate like parts throughout the figures and wherein:

Fig. 1 is a perspective view of the rack with panels shown therein;

Fig. 2 is a perspective view showing the panel and lower portion of the rack guideways in greater detail;

Fig. 3 illustrates a modification of the rack.

Before describing the present invention it might be well to describe the panel used in these particular machines. As best seen in Fig. 2 panel 11 has a rectangular frame with side members 12 and 13, bottom member 14, and top member 16. Integral with top member 16 is a handle 17 extending obliquely, outwardly from a vertical side of this top member.

Conventionally, these panels are inserted in their storage racks either in a horizontal position with all four of the frame members 12, 13, 14 and 16 serving as a base and the handle disposed in a horizontal direction and extending upwardly from the top member 16 which is located outboard or with either side members 12 or 13 serving as a base and the handle 17 outboard and disposed in a vertical direction. However, when the panels are inserted in the machine, bottom member 14 serves as the base.

In the present invention the rack arrangement is such as to permit insertion of the panels into the rack in such a way that the panels 11 are supported on their bottom members 14, the manner in which they are supported in the machine. To accomplish this, special guideway configurations are provided.

The rack which is made of metal or other suitable material comprises a number of panel-holding sections in tiers. In the embodiments shown there are two tiers, but the number of tiers may be varied as a matter of choice. Referring to the lower tier as seen in Fig. 1, mounted on transverse frame members 19 and 21 within housing 22 are parallel, equally-spaced rows of right-angled, U-shaped channels 23 in which the bottom members 14 of panels 11 seat. The upstanding sides 24 and 26 of these channels 23 are rounded and outwardly flared as seen in portions 27 and 28 (Fig. 2) to facilitate entry of the panel bottom members 14 into the channels. Rollers 29, of conventional construction and preferably of nylon, are positioned at spaced intervals in the bottom of each channel 23 and extend above the bottom of each channel so that they provide a friction-reduced path along which each panel slides into or out of the rack. Ball bearings or any other suitable friction-reducing elements may be used as an alternative to the rollers for yielding this same result. Mounted to the underside of transverse frame members 31 and 32 are parallel rows of equally-spaced, downwardly-facing U-shaped members 33 whose sides 34 and 36 are rounded at their outer ends. The right-hand side 36 of each member 33 is in vertical alignment with the left-hand side 24 of an underlying channel 23 so as to yield the left-hand side of the guideway for each panel. The right-hand side of the panel

guideway is formed at the top by the left-hand side 34 of the following member 33 and at the bottom by the right-hand side 26 of the aforementioned channel 23. As previously borne out, the breadth of channels 23 is such as to accommodate the breadth of bottom frame member 14. Members 33 are so spaced from one another that the distance between right and left-hand sides of consecutive members is sufficient to accommodate the combined breadth of panel top member 16 and handle 17. The left-hand sides 34 of members 33 are shorter than the right-hand sides 36 thereof. This makes for easy access by the operator's hand for grasping the panel handle 17. The back portion 15 of housing 22 serves as a back-stop for each panel 11.

The upper tier is substantially a duplicate of the lower tier the only difference being that the upper members 33 therein are mounted to the top portion of the housing.

In another embodiment portrayed by Fig. 3 the left-hand sides 34¹ of the upper members 33¹ do not extend down vertically, but slope at an angle. This requires a slightly greater spacing of consecutive upper members and lower channels than in the previous embodiment.

In transferring a panel from its position in the machine an operator lifts the panel out of the machine by the handle and without having to turn the panel or shift his handhold introduces the panel bottom into the channel and then slides the panel back into the rack, the panel's top end and handle being guided by the upper members. The rollers at the bottom of the channels enable quick and easy sliding of the panels into or out of the racks. In the reverse operation the operator grasps the handle of the desired panel in the rack and with a swift easy motion which requires no turning of the panel or shift of handhold extracts it from the rack and places it into the machine.

Obviously many modifications and variations are possible in the light of the above teachings. It is therefore to be understood, that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

What is claimed and desired to be protected by Letters Patent of the United States is:

1. A rack for storing control panels, of the type which has a rectangular-shaped outer frame and a hand-grasp handle extending obliquely outwardly and upwardly from its top frame member and substantially along the length of said top frame member when the panel is in its upright, operative, in-machine position, comprising a housing, means within said housing for allowing transfer between in-rack and in-machine positions of each panel by a swift single movement involving no change of handholds by the operator, said means comprising a plurality of equally-spaced parallel upwardly-facing substantially U-shaped channels disposed at the bottom of said housing and a plurality of downwardly-facing substantially U-shaped members, whose sides are rounded at the rack-entry end and whose left-hand sides are shorter than their right-hand sides so as to facilitate grasping of the handle of the panel, disposed in equally-spaced parallel rows at the top of said housing, the right-hand side of each downwardly-facing member being vertically aligned with the

left-hand side of one of said upwardly-facing channels, each of said upwardly-facing channels being of a width adapted to provide a seat for the panel bottom edge and the downwardly-facing members being so spaced from one another as to provide a breadth between the left and right-hand sides respectively of consecutive members which is adapted to accommodate the combined width of the panel top frame member and the handle, said breadth being substantially greater than the width of each of said channels, each panel when in stored position being constrained on three of its edges, at the top by portions of consecutive downwardly-facing members, at the back by the housing, and at the bottom by the upwardly-facing channel.

2. A rack for storing computer control panels of the type which has a rectangular-shaped outer frame and a hand-grasp handle extending obliquely upwardly and outwardly from its top frame member and substantially along the length of said top frame member when the panel is in its upright, operative, in-computer position comprising a housing, means within said housing for allowing transfer between in-rack and in-computer positions of each panel by a swift single movement involving no change of handholds by the operator, said means comprising a plurality of equally-spaced parallel upwardly facing substantially U-shaped channels disposed at the bottom of said housing, each channel having rollers at spaced intervals along its bottom portion and having upwardly extending sides which are outwardly flared and rounded at their outer, panel-entry ends and a plurality of downwardly-facing substantially U-shaped members, both of whose downwardly-projecting sides are rounded at their panel-entry ends and whose left-hand downwardly-projecting sides are shorter than their right-hand downwardly-projecting sides, disposed in equally-spaced parallel rows at the top of said housing, the right-hand side of each downwardly-facing member being vertically aligned with the left-hand side of one of said upwardly-facing channels, each of said upwardly-facing channels being of a width adapted to provide a seat for the panel bottom edge and the downwardly-facing members being so spaced from one another as to provide a breadth between the left and right-hand sides respectively of consecutive members which is adapted to accommodate the combined width of the panel top frame member and the handle, said breadth being substantially greater than the width of each of said channels, each panel when in stored position being constrained on three of its edges, at the top by portions of consecutive downwardly-facing members, at the back by the housing, and at the bottom by the upwardly-facing channel.

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