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National Electric Code Compliant Integrated Rack Ladder

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Abstract:

As rack power and processor densities increase, the rack heights are forced into racks taller than 42U in height. Within these tall rack systems, it is difficult for the average height operator to reach components mounted in upper positions. Even more critical is access to power safety breakers, if these are placed above the 2 meter National Electric Code specification. Access to ladders in factories and data centers is not convenient, and often times not safe. Disclosed is a technique for integrating a ladder into the rack which benefits the operator and improves safety.

Description:

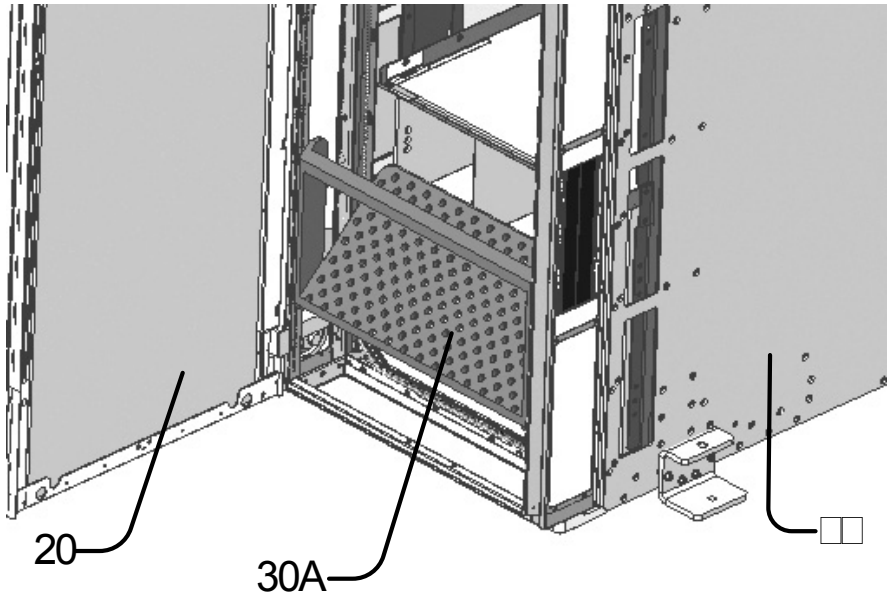
This disclosure relates to the field of rack systems for computers and other devices.

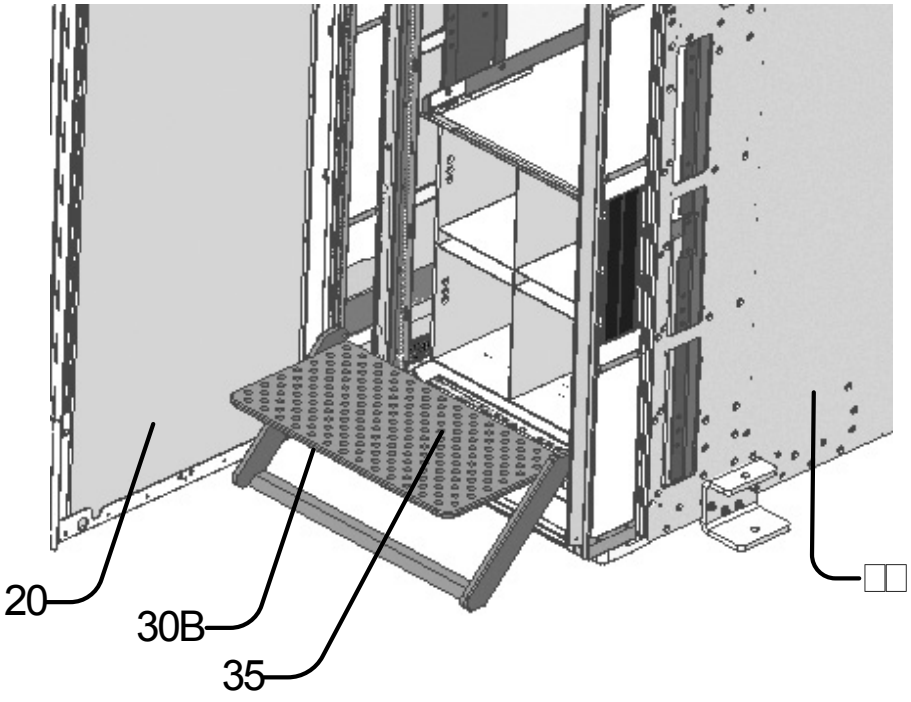
A technique is disclosed that integrates a ladder into a rack of computers or other electrical equipment.

Increasing computer rack densities and rack heights inhibits easy and safe access to components which are above the reach of an average height operator or user. As a result, such operators often make use of a ladder to reach these higher components. However, access to ladders in factories and data centers can be problematic. First, a ladder must be located. It may not always be stored in a known location, or may be in use by another operator. It can also be difficult to transport and properly use the ladder, given the tight spacing that often exists in the front and rear of racks. At some sites, the use of a ladder requires special training, and may even require opening an official work order "ticket" to obtain a ladder. The use of a traditional ladder can therefore be frustrating and/or time-consuming for the operator, and the lack of timely ladder access in the needed location can in some cases cause unsafe conditions, for example if a safety breaker needs to be flipped but the breaker is placed above the operator-reachable height.

According to the present disclosure, and as understood with reference to the Figure, a height assistance step mechanism 30 (illustrated in positions 30A, 30B) is integrated into a rack 10. In some embodiments, the mechanism 30 rests vertically with the frame of the rack 10 when the rack doors 20 are closed, and then folds out when needed. The front doors 20 usually have about a two inch depth curvature, which allows the step mechanism 30 (in position 30A) to reside in, or on, the door cavity, or behind the door 20. The step mechanism 30 can be quickly folded down into an operational position (position 30B) in case of emergency. The mechanism 30 can also easily be adjusted or removed to access the equipment which is positioned behind it in the rack 10. The step mechanism 30 does not block air flow or impede thermal performance. In some examples, the step mechanism 30 has a sufficiently large step surface 35 to allow the operator to stand comfortably on it. In some examples, the step mechanism 30 can be made smaller and/or thinner because it likely is used only intermittently.

The disclosed integrated rack step ladder function advantageously provides faster and safer access to rack equipment. It also opens up component option placement by providing a solution which meets National Electric Code requirements regarding the positional height of power delivery safety features.





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