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Bergerhoff et al.

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[54] **SHELF LOADER FOR LONG MATERIALS**

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[30] **Foreign Application Priority Data**

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[51] **Int. Cl.**..... **E04h 6/06**

[58] **Field of Search** ..... 214/16.4 A, 16 AB, 214/16.1 C–16.1 CE, 730

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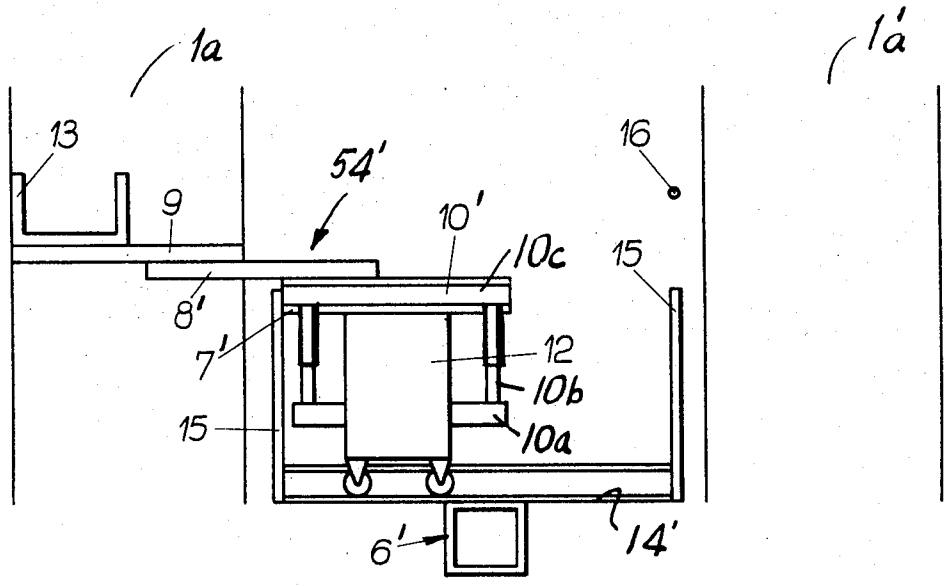
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Attorney—McGlew and Toren

[57] **ABSTRACT**

A shelf loader for long materials comprises an elongated frame which is movable on wheels between shelf compartments and which carries a lift frame which is movable upwardly and downwardly on a side thereof. The lift frame provides a stand for one or more operators and it includes a telescoping member having a load carrier thereon which may be shifted laterally in a direction toward the shelf compartments for the purpose of lifting long elements from the shelves or inserting them on the shelves. In one form the load carrier is attached to the lifting frame by hinged braces which permits it to be lifted upwardly and shifted laterally, and in another arrangement it is carried on a car which may be moved transversely along the lifting frame from one shelf side to an opposite shelf side. The lifting frame is adapted to carry a removable hoist. The load bearing platform is advantageously carried on a support truss which is vertically movable in order to shift the load off the carrier to permit the shifting movement of the carrier and the realignment of the load therewith at a laterally spaced location. The load carrier itself includes transversely shiftable portions so that the load may be shifted by a combination of movements of the shiftable load carrier portions and the lifting truss.

1 Claim, 9 Drawing Figures



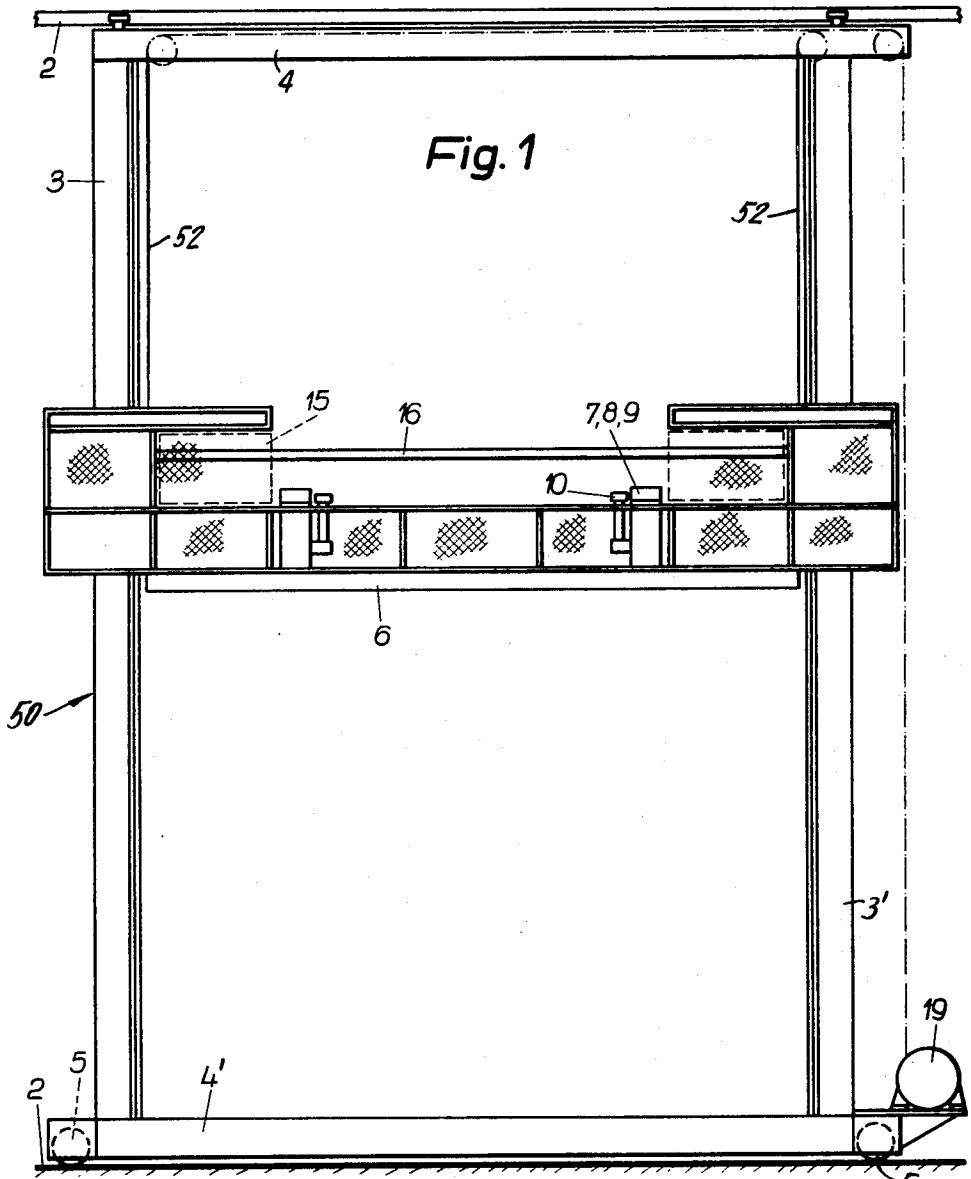


Fig. 1

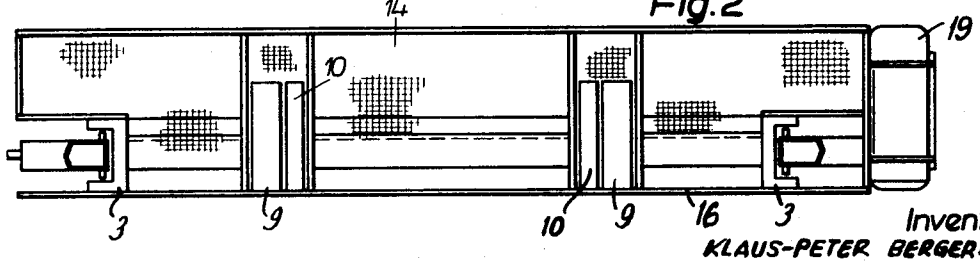
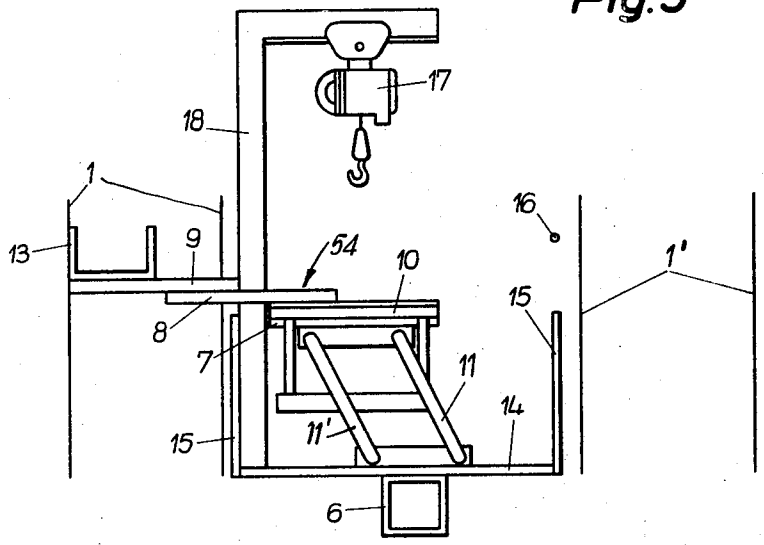


Fig. 2

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Fig. 3



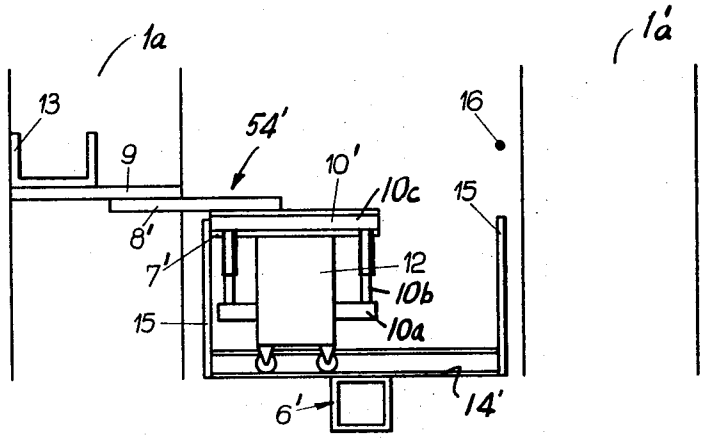


Fig. 4

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Fig. 5a

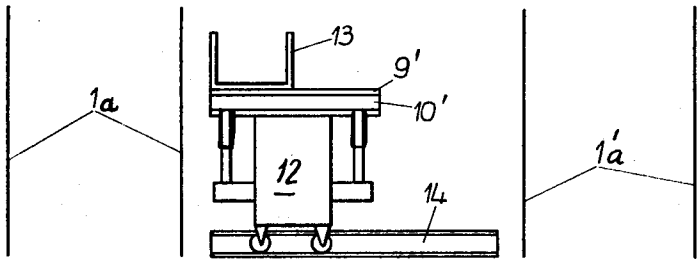


Fig. 5b

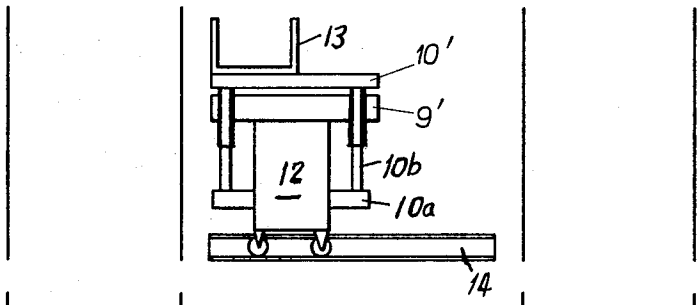


Fig. 5c

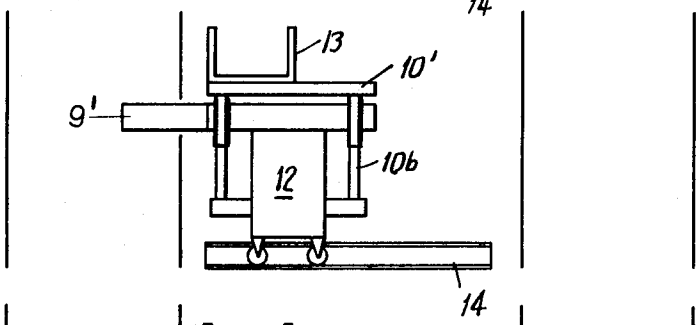


Fig. 5d

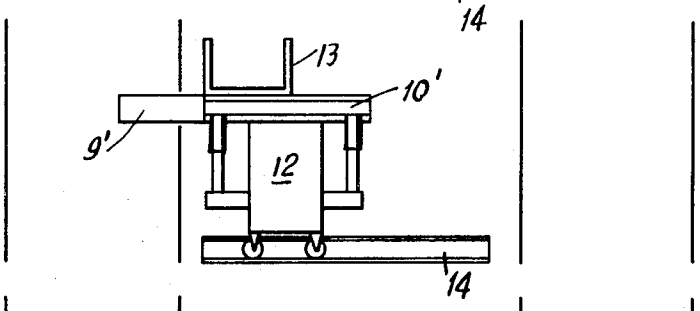
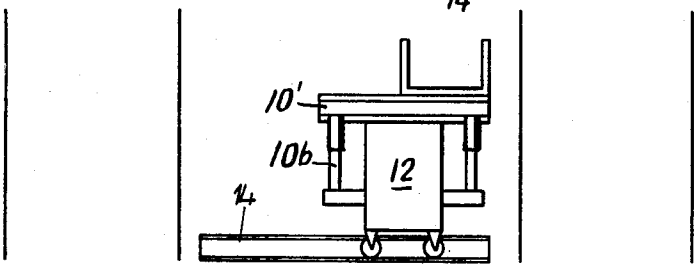


Fig. 5e



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SHELF LOADER FOR LONG MATERIALS

SUMMARY OF THE INVENTION

This invention relates in general to the construction of a shelf loader and in particular, to a new and useful shelf loader particularly for long materials including a long lifting frame disposed between two guide columns and load carriers and which is movable from side to side into shelf compartments on either side of the shelf loader and which includes one or more telescopic parts for facilitating transfer of the load and which also defines a stand for one or more operators.

The known shelf loaders are suited for loading and unloading long materials into and out of shelf compartments from one side. Shelf loaders for loading from the front are also known and they may be equipped with strands for operators. The known shelf loaders for long materials are suited only for complete loading and unloading of the shelf compartments. Consigning, meaning the assembly of orders from various shelves is not possible with these machines.

In accordance with the present invention a shelf loader for long materials is provided which is suited both for the loading and unloading of the shelf compartments and the assemblying or orders. This problem is solved by an arrangement of a centrally located telescoping part on the load carrier which may be shifted around on the lifting frame in the direction toward the shelf compartments. The lifting frame is made wider than the load carrier in order to form a stand. The shelf loader travels in aisles between the shelf compartments. In order to assemble orders the central telescoping part is shifted to the shelf side in which the desired long material is stored. Then there is a free side on the lifting frame which forms a stand for the operators who reach over the material bins resting on the load carriers at the shelf side. In order to take material out of the respective shelf side the central telescoping part is moved to the other shelf side. The operators stand at the ends of the stand while the central telescoping part is shifted.

According to another characteristic of the invention, the load carriers may be attached to the lifting frame by hinged braces which permit the raising and lowering of the load carriers and the lateral shifting thereof or they may be carried on cars or sliding boxes which are movable transversely along the lifting frame. The use of the hinged braces entails the disadvantage that the load must be lifted in order to pivot the hinge braces. Suited for this purpose, according to the invention, is an overhead hoist which is disposed on the lifting frame and is movable above the load carrier in the direction toward the shelf compartments. It may be even used for consigning heavy parts. It is disposed between the guide columns and readily movable in order not to interfere when the material bins are moved into the shelf compartments.

In a further characteristic of the invention support trusses are arranged below the carriers for the loads and they are equipped with load indicators. The height adjustment of the support trusses serve for the lifting of the long materials of material bins off the load carriers so that the latter can be moved underneath the long material into the position in which loading of the material into the desired compartments is possible. Raising the support trusses may be accomplished either mechanically or hydraulically. The load carrier itself may include an intermediate part which may be disposed in a manner such that it is between the telescoping part and the load carrier and it can move as far as possible into the shelf compartments beyond the center row telescopic part in order to position the materials for loading and unloading as desired.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there are illustrated and described preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a side elevational view of a shelf loader constructed in accordance with the invention;

FIG. 2 is a top plan view of the shelf loader indicated in FIG. 1;

FIG. 3 is a partial side elevational view of the lifting frame of the shelf loader;

FIG. 4 is a view similar to FIG. 3 of another embodiment of the invention; and

FIGS. 5*a* to 5*b*, 5*c*, 5*d*, and 5*e* are schematic side elevational views indicating the manner in which the load carrier and support trusses cooperate during a shifting operation.

GENERAL DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings in particular, the invention embodied therein in FIGS. 1 and 2 and 3 comprises a shelf loader generally designated 50 which comprises a guide frame having guide columns 3, 3' and longitudinal beams 4, 4' carrying wheels 5, 5' which permit the device to be moved along a trackway 2 between rows of shelves generally indicated and designated 1 and 1', respectively.

In accordance with the invention a lifting platform or frame 6 is supported on lifting cables 52, 52 and may be moved upwardly and downwardly in respect to the loader frame 50 under a control of a motor 19.

The lifting frame 6 supports a stand 14 which is equipped at its end faces with a laterally length-adjustable protective railing 15. As shown in particular in FIG. 3, the platform 14 provides a mounting for a load supporting assembly 54 which includes a central telescoping part 7 which is supported on braces 11, 11' which are parallelly arranged and pivotally supported. The braces 11, 11' support the central telescopic part 7 of the load bearing device or load support 54 which also includes an intermediate part 8 and an outer or load carrier carrying part 9 which may be shifted laterally to the extended position indicated in FIG. 3. In this embodiment an overhead hoist 17 which is carried on an upright member or support 18 and the support 18 is removably carried on the lifting frame 6. In FIG. 3, the load carrying device 54 is shown in an extended position in which material bin 13 is oriented in a position at which it may be deposited within the shelves 1. There is ample space on the platform 14 for an operator between the load carrier mechanism 54 and the edge of the stand 14 and this is made safe for the operator by a protective railing 15 and a bar 16 which is at-

tached to the edge of the protective railing **15** and is readily removable.

In the embodiment indicated in FIG. **4**, a lifting frame **6'** includes a load supporting mechanism **54'** which is arranged directly adjacent a lifting truss **10'** which includes a fixed lower part **10***a* having extensible supporting arms **10***b* on each end which, for example, may be fluid piston and cylinder sets for raising and lowering a supporting platform portion **10'***c* of the truss in order to facilitate the lifting of the load onto and off of the loading device **54'**. In this embodiment the loading device **54'** also includes the platform portion **7'**, **8'** and **9'** similar to that of FIG. **3** embodiment. In this construction, the central telescoping part **7'** is supported on a sliding box member **12** which may be shifted backwardly and forwardly on the platform **14'** between the shelf compartments **1***a* and **1***a'* on each side thereof.

In the schematic showing of FIGS. **5***a* to **5***e*, the sequence of operations which are necessary to transfer a material bin **13** from one side of the shelf **1***a* to another aide **1***a'* is shown. The material bin **13** for storing long materials is at rest on the left side of the shelf loader on the platform portion **9'** and it arrives at its position as indicated in FIG. **5***a* as a result of the material bin **13** being lifted out of the shelf compartments **1***a*. The material bin **13** is then lifted off the load carrier platform **9** by the supporting truss **10'** as indicated in FIG. **5***b*. In a position of **5***c*, the load carrier platform **9'** is moved to the left and in **5***b* the material bin **13** is lowered down on the load carrying platform **9'** once again. The supporting truss **10'** is lowered further so that the material bin **13** can be moved to the right according to the showing in FIG. **5***e*.

What is claimed is:

1. A shelf loader for loading materials on one or more shelf compartments arranged in rows, comprising a loader frame adapted to be moved between the rows of the shelf compartments, a lift platform, means supporting said lift platform on said loader frame for up and down vertical movement thereon, a supporting plate carried on said lift platform, a box member movable along said platform from side to side thereof and carrying said supporting plate, at least one loader carrier plate on said supporting plate and being shiftable laterally in respect to said supporting plate in directions toward and away from the shelf compartments on each side of said lift platform, and lift truss means on said box member and connected to said supporting plate and including a member movable below said supporting plate to engage a load on said plate and lift it upwardly therefrom.

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