

SPECIFICATION

Material handling carts

5 This invention relates to material handling carts and more particularly to a strong light-weight material handling cart for storing and transporting cantilevered material handling totes.

10 In modern manufacturing processes, particularly those employed in the electronics industry, there is a need for a facility to handle large numbers of comparatively small electronic parts such as printed circuit boards and the like. During these manufacturing processes, there is need to store parts and subassemblies at various stages of the processing.

15 For example, parts and subassemblies need to be stored in large storage areas in large numbers and to have the ability to be moved in large quantities by industrial fork trucks and the like. These parts in smaller numbers also may need to be removed from storage areas to work areas and from one work area to another by hand carts and the like and be stored at work areas under work surfaces or on vertical wall surfaces for access by manufacturing personnel.

20 A system has been developed which employs a uniquely designed material handling tote of the type disclosed in U.S. Patent Application Serial No. 212,946 (Schreiner et al). This material handling tote may be employed in a total material handling system and

25 may be, for example, stored in large numbers on the pallet frame disclosed in U.S. Patent Application Serial No. 212,953 (Schreiner), or moved from place to place, from a major storage area to a work area or from one work area to another work area on a versatile material handling cart of the type disclosed in the application. Additionally, as a part of the overall system, the material handling tote may be supported by a wall hung support rail of the type disclosed in copending U.S. Patent Application Serial No. 212,944 (Schreiner), or stored beneath a work surface on pairs of tote guides of the type disclosed in copending U.S. Patent Application Serial No. 212,945 (Schreiner).

30 Material handling carts of the present invention are an integral part of the above-described system and provide for the transportation and storage of material handling totes in manageable quantities.

35 Accordingly, the present invention resides in a material handling cart for storing and transporting a plurality of material handling totes of different depths, said cart comprising:

40 a pair of spaced parallel vertical members; a plurality of equidistantly spaced horizontal support rails interconnecting said pair of spaced parallel vertical members; a forwardly and downwardly projecting support leg connected to each of said vertical members, said

forwardly and downwardly projecting support legs terminating in a vertical portion remote from their connection to said vertical members; and a first pair of casters, one each

70 mounted in the bottom of each of said vertical members, and a second pair of casters one each mounted in the end of each of said vertical portions of said support legs.

The spaced parallel vertical members include curved handle portions and hand grips at the ends of the vertical members remote from the casters. The horizontal support rails are tubular and include a flat back portion and a front portion that is parallel with the back

80 portion for its lower half and tapered toward the back portion for its upper half to thereby accommodate material handling totes of the type disclosed in the aforesaid copending U.S. Patent Application Serial No. 212,946

85 in a cantilevered position. Triangular brace means interconnect each of the vertical members with its associated downwardly projecting support leg.

In order that the invention can be more clearly understood, a convenient embodiment thereof will now be described, by way of example, with reference to the accompanying drawings, in which:

90 *Figure 1* is a prospective view of the material handling cart of this invention;

Figure 2 is a front elevation view thereof including material handling totes;

Figure 3 is a side elevation view thereof having cantilevered material handling totes thereon;

Figure 4 is a top plan view thereof also including a material handling tote;

Figure 5 is a sectional view taken along the line V-V of Fig. 2; and

100 *Figure 6* is a side elevation view or a rear caster with a portion of the support post broken away.

Referring now in detail to the drawing wherein like reference numerals represent like parts throughout the several views, there is illustrated in Fig. 1, a material handling cart which includes a pair of spaced parallel vertical or upright members 12 having rearwardly curved upper portions 14 which include handle grips 16 on the ends thereof. The spaced vertical members 12 have projecting downwardly and forwardly from about their mid point forward support legs 18 which curve downwardly at their forward ends into a vertical short leg portion 22 which extends parallel with the vertical members 12. Each of the vertical members 12 and the vertically extending portions 22 of the support legs are tubular and have open ends for receiving casters. The short portions 22 at the front of the material handling cart receive rotatable casters 24 while the bottoms of the upright members 12 are provided with fixed casters 26 which are prevented from rotating in the bottom end of the members 12 by pins 28 which extend

through both the lower portion of the support member 12 and the caster stud 30.

The spaced vertical or upright members 12 are interconnected by a plurality of vertically spaced, parallel horizontal support rails 32 which are adapted to carry thereon a material handling tote 34 of the type disclosed in copending U.S. Patent Application Serial No. 212,946 (Schreiner et al). The totes 34 are provided with a uniquely designed flange 36 which will permit them to be cantileverly mounted to the support rails 32 along any of the four edges of the tote 34. The forward support legs 18 are interconnected by a lateral rigidizing member 38 which interconnects the forward support legs 18 in their vertically oriented portions 22. In order to provide a strong and yet lightweight material handling cart, triangular support braces 40 are provided at the intersection of the vertical members 12 and the forwardly and downwardly projecting forward support legs 18.

The horizontal support rails 32 are tubular and include a flat back portion 42 and a front portion that is parallel with the back portion for its lower half 44 and tapered toward the back portion for its upper half 46 in order to accommodate and carry in a cantilevered fashion a material handling tote of the type disclosed at 34.

The upright or vertical members 12 and the forward support legs 18 are preferably 14 gauge steel tubing and provide in side elevation a pair of substantially h-shaped side members wherein the horizontal portion is sloped down and away from the longer vertical portion and terminates in a short vertical leg to provide four corners of vertically oriented hollow tubes to receive conventional casters 24 and 26.

As will be apparent from the foregoing, the material handling cart of this invention is a lightweight but structurally rigid push-type cart which is adapted to carry a plurality of material handling totes in a cantilevered fashion from the plurality of horizontal support rails which form a vertical open back to the cart and is particularly adapted for providing storage as well as transportation for material handling totes employed in an integrated material handling system for electronic parts and the like.

CLAIMS

1. A material handling cart for storing and transporting a plurality of material handling totes of different depths, said cart comprising:
a pair of spaced parallel vertical members;
a plurality of equidistantly spaced horizontal support rails interconnecting said pair of spaced parallel vertical members;
a forwardly and downwardly projecting support leg connected to each of said vertical members, said forwardly and downwardly projecting support legs terminating in a vertical

portion remote from their connection to said vertical members; and

a first pair of casters, one each mounted in the bottom of each of said vertical members, and a second pair of casters one each mounted in the end of each of said vertical portions of said support legs.

2. A cart according to claim 1, wherein the first pair of casters are fixed in a plane perpendicular to the horizontal support rails and the second pair of casters are rotatable in the vertical portions of the support legs.

3. A cart according to claim 1 or 2, wherein the pair of spaced parallel vertical members include curved handle portions and hand grips at the upper ends thereof remote from the casters.

4. A cart according to claim 1, 2 or 3, wherein the horizontal support rails are tubular and include a flat back portion and a front portion parallel with said back portion for its lower half and tapered towards said back portion for its upper half.

5. A cart according to any of claims 1 to 4, wherein triangular brace means interconnect the spaced parallel vertical members and the forwardly and downwardly projecting support legs adjacent their intersection.

6. A material handling cart for storing and transporting a plurality of material handling totes of different depths, said cart comprising:
a frame, said frame including a pair of substantially h-shaped side members with horizontal portion being sloped down and away from the longer vertical portion;

a plurality of predeterminedly spaced horizontal support rails interconnecting said longer vertical portion of said substantially h-shaped side members; and

a horizontal connecting member interconnecting the shorter vertical portion of said substantially h-shaped side members.

7. A cart according to claim 6 wherein a first pair of casters are mounted one each in the bottom of each of said longer vertical portion and a second pair of casters are mounted one each in the end of the shorter vertical portions of said frame, said first pair of casters being fixed in a plane perpendicular to said horizontal support rails and said second pair of casters being rotatable in said shorter vertical portions of said frame.

8. A cart according to claim 6 or 7, wherein the longer vertical portion of the substantially h-shaped side members each terminate in a curved upper portion extending in opposite direction from the horizontal portion.

9. A cart according to claim 6, 7 or 8, wherein a horizontal connecting member interconnects the vertical portion of said forwardly and downwardly projecting support legs.

10. A cart according to any of claims 6 to 9, wherein triangular support braces interconnect the longer vertical portions of the sub-



through both the lower portion of the support member 12 and the caster stud 30.

The spaced vertical or upright members 12 are interconnected by a plurality of vertically spaced, parallel horizontal support rails 32 which are adapted to carry thereon a material handling tote 34 of the type disclosed in copending U.S. Patent Application Serial No. 212,946 (Schreiner et al). The totes 34 are provided with a uniquely designed flange 36 which will permit them to be cantileverly mounted to the support rails 32 along any of the four edges of the tote 34. The forward support legs 18 are interconnected by a lateral rigidizing member 38 which interconnects the forward support legs 18 in their vertically oriented portions 22. In order to provide a strong and yet lightweight material handling cart, triangular support braces 40 are provided at the intersection of the vertical members 12 and the forwardly and downwardly projecting forward support legs 18.

The horizontal support rails 32 are tubular and include a flat back portion 42 and a front portion that is parallel with the back portion for its lower half 44 and tapered toward the back portion for its upper half 46 in order to accommodate and carry in a cantilevered fashion a material handling tote of the type disclosed at 34.

The upright or vertical members 12 and the forward support legs 18 are preferably 14 gauge steel tubing and provide in side elevation a pair of substantially h-shaped side members wherein the horizontal portion is sloped down and away from the longer vertical portion and terminates in a short vertical leg to provide four corners of vertically oriented hollow tubes to receive conventional casters 24 and 26.

As will be apparent from the foregoing, the material handling cart of this invention is a lightweight but structurally rigid push-type cart which is adapted to carry a plurality of material handling totes in a cantilevered fashion from the plurality of horizontal support rails which form a vertical open back to the cart and is particularly adapted for providing storage as well as transportation for material handling totes employed in an integrated material handling system for electronic parts and the like.

CLAIMS

1. A material handling cart for storing and transporting a plurality of material handling totes of different depths, said cart comprising:
a pair of spaced parallel vertical members;
a plurality of equidistantly spaced horizontal support rails interconnecting said pair of spaced parallel vertical members;
a forwardly and downwardly projecting support leg connected to each of said vertical members, said forwardly and downwardly projecting support legs terminating in a vertical

portion remote from their connection to said vertical members; and

a first pair of casters, one each mounted in the bottom of each of said vertical members, and a second pair of casters one each mounted in the end of each of said vertical portions of said support legs.

2. A cart according to claim 1, wherein the first pair of casters are fixed in a plane perpendicular to the horizontal support rails and the second pair of casters are rotatable in the vertical portions of the support legs.

3. A cart according to claim 1 or 2, wherein the pair of spaced parallel vertical members include curved handle portions and hand grips at the upper ends thereof remote from the casters.

4. A cart according to claim 1, 2 or 3, wherein the horizontal support rails are tubular and include a flat back portion and a front portion parallel with said back portion for its lower half and tapered towards said back portion for its upper half.

5. A cart according to any of claims 1 to 4, wherein triangular brace means interconnect the spaced parallel vertical members and the forwardly and downwardly projecting support legs adjacent their intersection.

6. A material handling cart for storing and transporting a plurality of material handling totes of different depths, said cart comprising:
a frame, said frame including a pair of substantially h-shaped side members with horizontal portion being sloped down and away from the longer vertical portion;

a plurality of predeterminedly spaced horizontal support rails interconnecting said longer vertical portion of said substantially h-shaped side members; and

a horizontal connecting member interconnecting the shorter vertical portion of said substantially h-shaped side members.

7. A cart according to claim 6 wherein a first pair of casters are mounted one each in the bottom of each of said longer vertical portion and a second pair of casters are mounted one each in the end of the shorter vertical portions of said frame, said first pair of casters being fixed in a plane perpendicular to said horizontal support rails and said second pair of casters being rotatable in said shorter vertical portions of said frame.

8. A cart according to claim 6 or 7, wherein the longer vertical portion of the substantially h-shaped side members each terminate in a curved upper portion extending in opposite direction from the horizontal portion.

9. A cart according to claim 6, 7 or 8, wherein a horizontal connecting member interconnects the vertical portion of said forwardly and downwardly projecting support legs.

10. A cart according to any of claims 6 to 9, wherein triangular support braces interconnect the longer vertical portions of the sub-

stantially h-shaped side members and the horizontal portion of said substantially h-shaped side members at their intersection.

11. Material handling carts substantially
5 as described herein with particular reference to the accompanying drawings.



The text of the specification has been reproduced by photocopying. The original typescript may be inspected on the premises of the Patent Office