A mobile vacuum cart includes a housing, a vacuum source in the housing, a dust box releasably engaged in the housing and in fluid communication with the vacuum source, an intake conduit in fluid communication with the dust box, wherein the housing accommodates reciprocal sliding action of the conduit between an engaged position in which the conduit locks the dust box in position and a release position in which disengagement of the conduit from the dust box enables removal of the dust box from the housing.
MULTI-USE MOBILE VACUUM CART

RELATED APPLICATION


BACKGROUND

[0002] The present invention relates to mobile carts or workstations, and more specifically, such stations having internal vacuum systems.

[0003] Mobile workstations are used in a variety of work environments, where users require a mobile site for providing a work surface, storage of utensils, electrical outlets and the like. One exemplary use of such mobile workstations is the hair care industry, where stylists or barbers place and/or store clippers, combs, brushes, scissors, dryers, straightening irons, styling gels, hairspray, conditioners, among other things during the styling operation. Some such workstations or carts are provided with internal vacuum systems for cleaning up cut hair.

SUMMARY

[0004] The present mobile vacuum cart includes several features for use in the hair care industry, including a removable dust trap or dust box selectively locked in place with a reciprocating vacuum inlet tube. In a relatively lower position, the tube engages the dust trap and holds it in place in the housing. In a raised position, the tube is disengaged from the dust trap, allowing removal of the dust trap for periodic cleaning. The dust trap is preferably provided with a handle for facilitating removal from the housing. A movable dust pan vacuum intake is also associated with the housing, having an operational position in fluid communication with the dust trap, and at least one disengaged position enabling removal of the dust trap from the housing. A user-actuated mechanism manipulates the dust pan intake between the positions.

[0005] In addition, the dust trap has a user-operated control valve movable between a vacuum connection between the dust trap and the intake conduit, and between the dust pan and the dust trap. A T-or Y-fitting is optionally provided to the intake conduit for the connection of auxiliary hoses and/or vacuum-equipped hair clippers. Also, a variable speed vacuum controller is provided on the housing.

[0006] More specifically, a mobile vacuum cart includes a housing, a vacuum source in the housing, a dust box releasably engaged in the housing and in fluid communication with the vacuum source, an intake conduit in fluid communication with the dust box, wherein the housing accommodates reciprocal sliding action of the conduit between an engaged position in which the conduit locks the dust box in position and a release position in which disengagement of the conduit from the dust box enables removal of the dust box from the housing.

[0007] In another embodiment, a mobile vacuum cart includes a housing, a source of vacuum associated with the housing, and a dustpan vacuum intake associated with the housing and movable between an operational position in fluid communication with the vacuum source and a storage position wherein the intake is disengaged from the vacuum source.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a front perspective view of the present mobile vacuum cart;

[0009] FIG. 2 is a side perspective view of the present mobile vacuum cart shown partially exploded;

[0010] FIG. 3 is a side perspective view of the mobile cart in FIG. 2 shown assembled;

[0011] FIG. 4 is a fragmentary top perspective view of the present mobile vacuum cart, with portions omitted for clarity;

[0012] FIG. 5 is a fragmentary side perspective view of the present mobile vacuum cart with the dustpan vacuum intake shown in a storage position;

[0013] FIG. 6 is a fragmentary side perspective view of the present mobile vacuum cart with the dustpan vacuum intake shown in an operational position;

[0014] FIG. 7 is a fragment side perspective view of the present mobile vacuum cart with the dustpan vacuum intake shown in the release or disengaged position;

[0015] FIG. 8 is a fragmentary front perspective of the present mobile vacuum cart with the dust box shown being removed;

[0016] FIG. 9 is a fragmentary top perspective view of the dust box and the dustpan vacuum intake showing a diverter valve in a first, “hose” position;

[0017] FIG. 9A is a fragmentary top perspective view of the dust box and dustpan vacuum intake showing the diverter valve in a second, “dust pan” position;

[0018] FIG. 10 is an interior view of the dust box with the diverter valve removed;

[0019] FIG. 11 is a front perspective of the present mobile vacuum cart with the intake conduit in fluid communication with the vacuum source;

[0020] FIG. 12 is a front perspective of an alternate embodiment of the present mobile vacuum cart;

[0021] FIG. 13 is a top perspective view of the present dust box;

[0022] FIG. 14 is a rear perspective view of the present vacuum cart with an access door closed; and

[0023] FIG. 15 is a rear perspective view of the cart of FIG. 14 with the access door open.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0024] Referring now to FIGS. 1-4, the present mobile vacuum cart is generally designated 10, and includes a housing 12 having a front wall 14, an opposite rear wall 16, a first side wall 18, an opposite second side wall 20, a top surface 22, and an opposite bottom surface 24. The walls 14-20 are preferably made of vacuum formed plastic; however other suitable light weight and reasonably priced materials and manufacturing techniques are contemplated. As is known in the art, the cart 10 is provided with a plurality and preferably four casters or wheels 26 preferably pivotably secured to the bottom surface 24.

[0025] A vacuum source 28 (FIG. 4), such as an electric vacuum motor, is associated with the housing 12, and is preferably mounted within an internal chamber 30 defined by the housing. As is known in the art, a power cord (FIG. 11) supplies power to the vacuum source 28 via a wall outlet or
the like. A plurality of exhaust openings 32 is provided on at least one and preferably both sidewalls 18, 20. While several horizontally arranged rows of such openings 32 are provided at various heights in the present cart 10, the location, size and number of exhaust openings 32 may vary to suit the application.

[0026] The front wall 14 partially defines a partially enclosed track 34 disposed vertically for accommodation of vertical reciprocating movement of an elongate inlet tube or intake conduit 36. While other shapes are contemplated, the intake conduit 36 is cylindrical and tubular, and may be flexible or rigid; however rigid is preferred. A radially-projecting locking pin 37 is preferably provided to the conduit 36 to hold it in position as will be described below. The track 34 is further defined in part by at least one clamp or bracket portion 40 secured to the front wall 14 to accommodate the vertical reciprocating sliding motion of the conduit 36 and to slidingly secure the conduit to the housing 12. In the preferred embodiment, there are two clamps, 40a and 40b. Upper clamp 40a is provided with a groove 41 for slidingly accommodating the locking pin 37 when the conduit is in a locked position. In a relatively raised and rotated release position, the locking pin 37 rests on an upper edge of the clamp 40a (FIG. 2).

[0027] Referring now to FIGS. 2-4, 9 and 13, below a lower end 42 of the intake conduit 36 is a dust box aperture 44 that is dimensioned to accommodate a dust box or dust trap 46. Included in the dust box 46 is a dust storage portion 48, a pull handle 50 for facilitating removal of the dust box 46 from the housing 12, a diverter or control valve generally designated 52 (FIG. 9) and an actuator 54. In the preferred embodiment, the dust box 46 has indicators 55 (Best seen in FIG. 13) for each of two selected valve positions, indicated as "hose" and "dustpan" described in greater detail below. A rear cowl 56 (FIG. 4) is provided at an open end 58 of the dust storage portion 48 that is sealingly placed in fluid communication with the vacuum source 28 within the internal chamber 30 to prevent the escape of air and collected debris.

[0028] An inlet port 60 projects from an upper wall 62 of the dust storage portion 48 and is in fluid communication with the dust storage portion. An important feature of the present cart 10 is that the inlet port 60 matingly engages the elongate intake conduit 36, and preferably the conduit passes inside the port. In this manner, the conduit 36 acts as a locking mechanism for retaining the dust box 46 within the housing 12 in fluid communication with the vacuum source 28. Thus, when the elongate intake conduit 36 is in an upper or raised release position in the track 34 (FIG. 2), the conduit is disengaged from the inlet port 60 and the dust box 46 is removable from the housing 12 for emptying of collected dust, hair and debris (FIGS. 2, 4 and 8). To retain the conduit 36 in the raised position, the conduit is axially rotated within the track 34 so that the locking pin 37 projects radially outward from the conduit and rests on an upper edge of the upper clamp portion 40a.

[0029] Conversely, when the conduit 36 is lowered to be in engagement with the inlet port 60, a bolt lock arrangement is formed so that the dust box 46 is locked in place in a manner that sealingly compresses or clamps the cowl 56 tightly against the vacuum source 28. To lower the conduit 36, it is rotated to free the locking pin 37, then pushed toward the bottom surface 24. The user manipulates the conduit 36 so that once the locking pin 37 is engaged in the groove 41, there is engagement between the conduit and the inlet port 60 (FIG. 1). The conduit 36 is then in an operational position in which there is fluid communication between the vacuum source 28 and the conduit. A feature of the present cart 10 is that the conduit 36 is the only locking mechanism for retaining the dust box 46 in place in the operational position.

[0030] As seen in FIG. 8, the housing 12 and the dust box 46 have complementary track-like guide formations 61, 63 for guiding the movement of the dust box as it releasably engages the housing. The guide formations 63 on the housing 12 are preferably inclined toward the vacuum source 28 to facilitate movement of the dust box 46 to that position.

[0031] Referring now to FIGS. 1 and 4-8, also provided on the front wall 14 is a dustpan vacuum intake 64 associated with the housing 12 and movable between a storage position (FIG. 5) and an operational position (FIGS. 1 and 6) in which an outlet 66 is in fluid communication with the source of vacuum 28. The dustpan vacuum intake 64 is constructed and arranged to provide an elongate aperture 68 constructed and arranged to be close to the substrate such as a floor when the intake 64 is placed in the operational position. Movement between the two positions is accomplished by rotation about a transverse pivot axis defined by pivot pins 70 on each side of the intake which are engaged in a bracket 72 mounted to the housing 12.

[0032] As seen in FIGS. 1 and 6, when in the operational position, the outlet 66 is connected to a dustpan port 74 in the dust box 46, preferably with a mating connection. As seen in FIGS. 5-7, the dustpan vacuum intake 64 is retained in the storage position by virtue of a lever or link 76 preferably pivotably secured at one end 77 to the dustpan vacuum intake 64 and at the opposite, handle end 78 to the housing 12 at a multi-notched bracket 79. To release the intake 64 from the storage position, the user grasps the handle end 78 of the lever 76 and moves the handle end to a designated notch on the bracket 79. (FIG. 7) In the preferred embodiment, there are three notch positions on the bracket 79, respectively relating to the operational position in which the dust pan intake 64 is lowered to the substrate (FIGS. 1, 3 and 6), an interim disengaged or raised position in which the intake 64 is raised slightly and fluid communication is disengaged between the intake and the dust box 46 to permit removal of the dust box (FIGS. 2 and 7) and a storage position, where the dustpan vacuum intake is raised to be generally parallel to the intake conduit 36 (FIGS. 5 and 11).

[0033] Referring now to FIGS. 8-10, the control or diverter valve 52 includes a generally hourglass-shaped, open box-shaped valve member 60 including a main wall 82 parallel to a front face of the dust box 46 and connected to the actuator 54, and a pair of transversely projecting peripheral skirts 84. Since the skirts 84 slidingly engage corresponding upper and lower inner surfaces of the dust box 46, they are preferably provided with edge-type dust seals 84a. The main wall 82 is provided with upper and lower portions 82a and 82b which together define an angle such that the skirts 84 are not axially aligned. Since the inlet port 60 and the dustpan port 74 are in axial alignment the valve member 80 is configured so that when the actuator 54 is positioned so that the "dustpan" indicator is designated (FIG. 9A), the inlet port 60 is blocked and the dustpan port 74 is open, creating fluid communication between the dustpan vacuum intake 64 and the dust box 46, preferably through an aperture 85 in the skirt 84. In the preferred embodiment, only the skirt 84 on the lower portion 82b is provided with the aperture 85. Conversely, when the “hose” indicator is designated (FIG. 9), the inlet port 60 is
open, creating fluid communication between the intake conduit 36 and the dust box 46, and the dustpan port 74 is blocked.

[0034] It will be noted that when the dust box 46 is to be removed, the actuator 54 is positioned in the “hose” position. The dust box 46 is preferably provided with a flap-like check valve 86 (shown fragmentarily in FIG. 9A) associated with the 85 and the dustpan port 74 to prevent the escape of collected debris through the port 74 when the actuator 54 is in the “dustpan” position. The check valve 86 opens when vacuum suction draws air through the dustpan port 74, and closes when the vacuum is turned aperture off to prevent the escape of collected debris.

[0035] Referring now to FIG. 10, to restrain the valve member 80 in the selected position, an interior 90 of the dust box 46 is provided with at least one arcuate stop formation 92, which is constructed and arranged to fractionally engage the corresponding skirt 84 and provide a stop restricting further rotation and thus hold the valve member 80 in place as determined by the user manipulating the actuator 54.

[0036] Referring now to FIGS. 1 and 11, the mobile vacuum cart 10 further includes an auxiliary intake hose 94 having a flexible portion 96 and a rigid angled portion 98 configured for insertion into the inlet port 60 through the bracket 405 as an optional replacement for the intake conduit 36, which then may be placed in mating engagement with the flexible portion 96. A conventional vacuum nozzle 97 is secured to the hose 94 as is known in the art. Since the rigid angled portion 98 is engageable in the bracket 405, it locks the dust box 46 in place in similar fashion to the inlet tube or intake conduit 36. A wire rack 100 (FIG. 1) is optionally provided to the housing 12 to store the auxiliary intake hose 94 when not in use. Also included on the housing 12, and preferably near the top surface 22 is a vacuum source controller 102 connected to the vacuum source 28. Preferably a conventional infinitely variable controller such as an SCR controller, the controller 102 provides the user with on/off and speed controls for the vacuum source 28 at an easily accessible location. An outlet strip 104 is optionally provided for powering tools, such as but not limited to hair care appliances including clippers, trimmers, dryers, straighteners, curling irons and the like. A cord wrap 106 is also preferably provided for a power cord 108.

[0037] Referring now to FIG. 12, an alternate embodiment to the present cart is generally designated 110. Shared components with the cart 10 are indicated with identical reference numbers. A main difference between the cart 10 and the cart 110 is that the latter lacks the dustpan vacuum intake 64. As such, the dust box 112 lacks the control valve 52 and the actuator 54, but otherwise works the same. A feature shown on the cart 110 but also available on the cart 10 is that an upper end 114 of the intake conduit 36/116 is provided with a multi-outlet fitting 118 such as a “T” or “Y”-fitting or the like with a diverter control 119 to allow selective fluid communication between the vacuum source 28 and an appliance 120, shown here as a hair clipper with a vacuum attachment 122, and another vacuum appliance such as a supplemental hose (not shown). Specifically, the clipper 120 has a flexible hose 124 that is connected to the fitting 118. Thus, hair clippings collected by the clipper 120 are passed through the hose 124 to the dust box 112 under suction provided by the vacuum source 28.

[0038] Referring now to FIGS. 14 and 15, at the rear wall 16 it will be seen that the present mobile vacuum cart 10 is provided with a plurality of storage locations for the user. Since the vacuum source 28 is located near the bottom surface 24, a substantial amount of the volume of the internal chamber 30 is available for storage purposes. More specifically, less than half of the internal chamber 30 is taken up by the vacuum source 28. In the preferred embodiment, a locking storage door 130 is hinged to the housing 12 along a lower edge 132, and opens to provide access to several storage trays or drawers 134 which are reciprocally slideable upon tracks 136 associated with the housing 12 to permit selective user access to stored contents. Alternative hinge arrangements are contemplated for the storage door 130. In addition to the storage capacity of the internal chamber 30, supplemental storage is provided on at least one and preferably both of the side walls 18, 20 in the form of shelves 138 having partitions 140, and/or towel racks 142.

[0039] While particular embodiments of the present multi-use mobile vacuum cart has been shown and described, it will be appreciated by those skilled in the art that changes and modifications may be made thereeto without departing from the invention in its broader aspects and as set forth in the following claims.

What is claimed:
1. A mobile vacuum cart, comprising:
   a housing;
   a vacuum source disposed in said housing;
   a dust box releasably engaged in said housing and in fluid communication with said vacuum source; and
   an intake conduit in fluid communication with said dust box; and
   said housing accommodates reciprocal sliding action of said conduit between an engaged position in which said conduit locks said dust box in position and a release position in which disengagement of said conduit from said dust box enables removal of said dust box from said housing.
2. The cart of claim 1 wherein said dust box has an inlet port and said intake conduit is in fluid communication with said inlet port when in said engaged position.
3. The cart of claim 1 further including a locking formation for retaining said conduit in said raised position to facilitate withdrawal of the dust box.
4. The cart of claim 1 wherein said conduit is the only locking mechanism for retaining said dust box in an operational position in said housing.
5. The cart of claim 1 further including a dustpan vacuum intake associated with said housing and movable between an operational position in fluid communication with said dust box and a storage position wherein said dust box is removable from said housing.
6. The cart of claim 5 further including a user actuated mechanism for moving said dust pan between said operational position and said storage position.
7. The cart of claim 6 wherein said dust pan is movable by said mechanism between said operational position, an interim disengaged position said storage position.
8. The cart of claim 5 wherein said dust box is engageable with a selected one of said intake conduit and said dust pan.
9. The cart of claim 8 further including a valve on said dust box for controlling said selective engagement between said intake conduit and said dust pan.
10. The cart of claim 9 further including a visual indicator on said dust box of a position of said valve.
11. The cart of claim 1 further including a pull handle on said dust box for facilitating removal from said housing.

12. The cart of claim 1 wherein said housing and said dust box have complement guide formations for guiding the movement of the dust box as it releasably engages the housing.

13. The cart of claim 1 further including an auxiliary intake hose in selective communication with said intake conduit and the dust box.

14. The cart of claim 1 wherein said intake conduit is provided with a multi-outlet fitting for selective fluid communication between two vacuum appliances or attachments.

15. A mobile vacuum cart comprising:
   a housing;
   a source of vacuum associated with said housing; and
   a dustpan vacuum intake associated with said housing and movable between an operational position in fluid communication with said vacuum source and a storage position wherein said intake is disengaged from said vacuum source.

16. The cart of claim 15 wherein said dust trap is provided with a control valve for selective communication between said dust pan intake and a vacuum intake conduit.

17. The cart of claim 15 further including an adjustment mechanism for moving said dustpan intake between said operational position and said storage position, said mechanism including a latch with at least two settings.

18. The cart of claim 17 wherein said adjustment mechanism includes settings for said operational position, a disengaged position, and said storage position.

19. The cart of claim 16 wherein said housing includes a track accommodating reciprocal movement of said intake conduit between an engaged position in which said conduit locks said dust trap in position and a release position in which disengagement of said conduit from said dust box enables removal of said dust box from said housing.

20. The cart of claim 16 further including a dust box releasably disposed in said housing and in selective fluid communication with said dustpan vacuum intake only in said operational position.

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