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Bard et al.

[11] **3,858,272**

[45] **Jan. 7, 1975**

[54] **VACUUM ASSEMBLY**

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[52] **U.S. Cl.** **16/115,** 55/357, 220/55.7

[51] **Int. Cl.** **B25g 1/04**

[58] **Field of Search** ..... 220/55.7, 55 T, 55 G, 45; 16/110.5, 115, 114 B, 126; 55/357

[56] **References Cited**

UNITED STATES PATENTS

733,470	7/1903	Easker	16/UX
1,137,078	4/1915	Nicodemus et al.	220/55.7
2,025,946	12/1935	Wenner-Gren	55/357 X
2,294,197	8/1942	Moore et al.	16/126 X
2,540,919	2/1951	Vallas	55/357 X
3,286,446	11/1966	Happe et al.	55/357

FOREIGN PATENTS OR APPLICATIONS

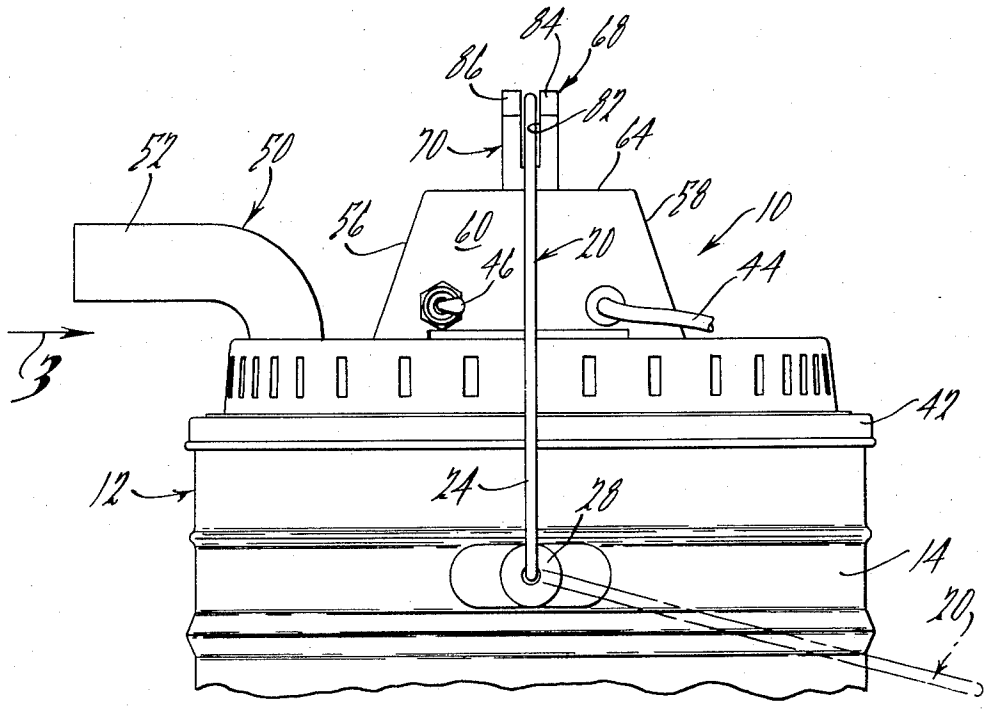
291,616	6/1928	Great Britain	16/115

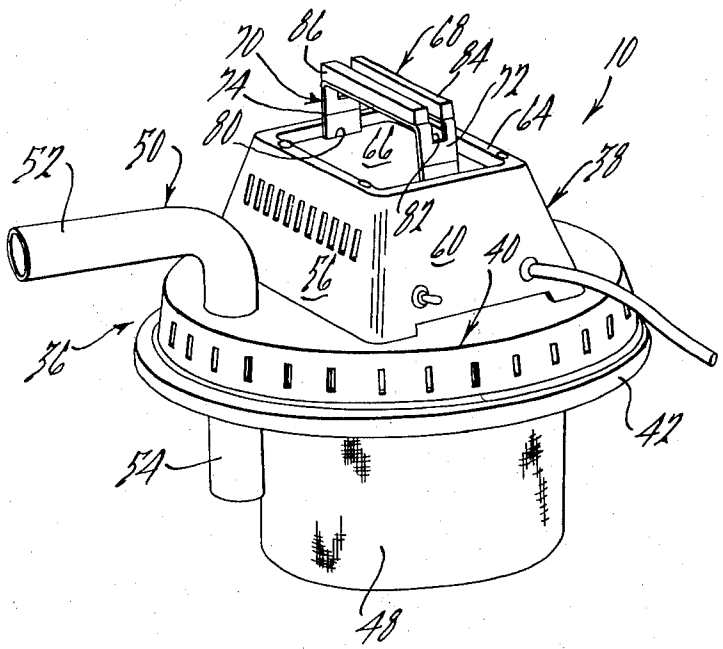
Primary Examiner—Donald A. Griffin
Attorney, Agent, or Firm—Harness, Dickey & Pierce

[57] **ABSTRACT**

A vacuum assembly adapted for operative association with an open upper-ended container; the assembly including a housing having an inlet and an outlet, an electrically energized vacuum motor within the housing, means cooperable with the container for supporting the housing adjacent the upper end thereof and adapted to sealingly engage the upper end of the container so as to define a generally air tight chamber therewithin, and first and second handle means on the assembly and the container movable to and from a position generally coincident with one another, whereby to permit simultaneous manual grasping of the first and second handle means to enable concomitant transport of the container and assembly as a composite structure.

19 Claims, 4 Drawing Figures




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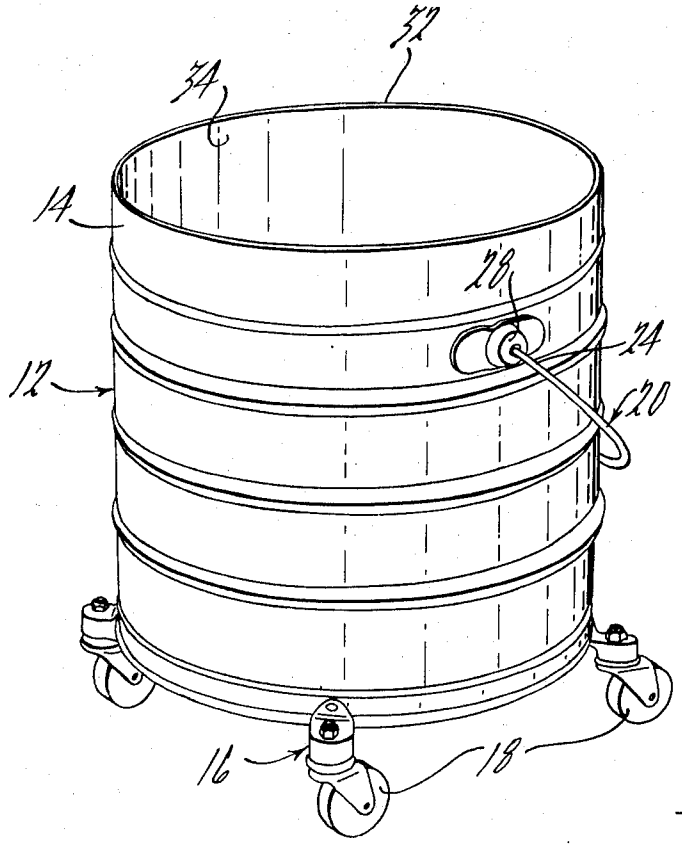

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Fig. 1.

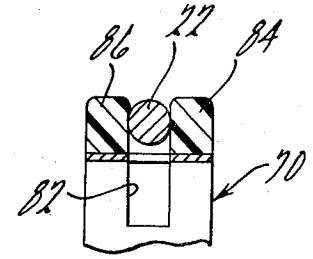

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Fig. 4.

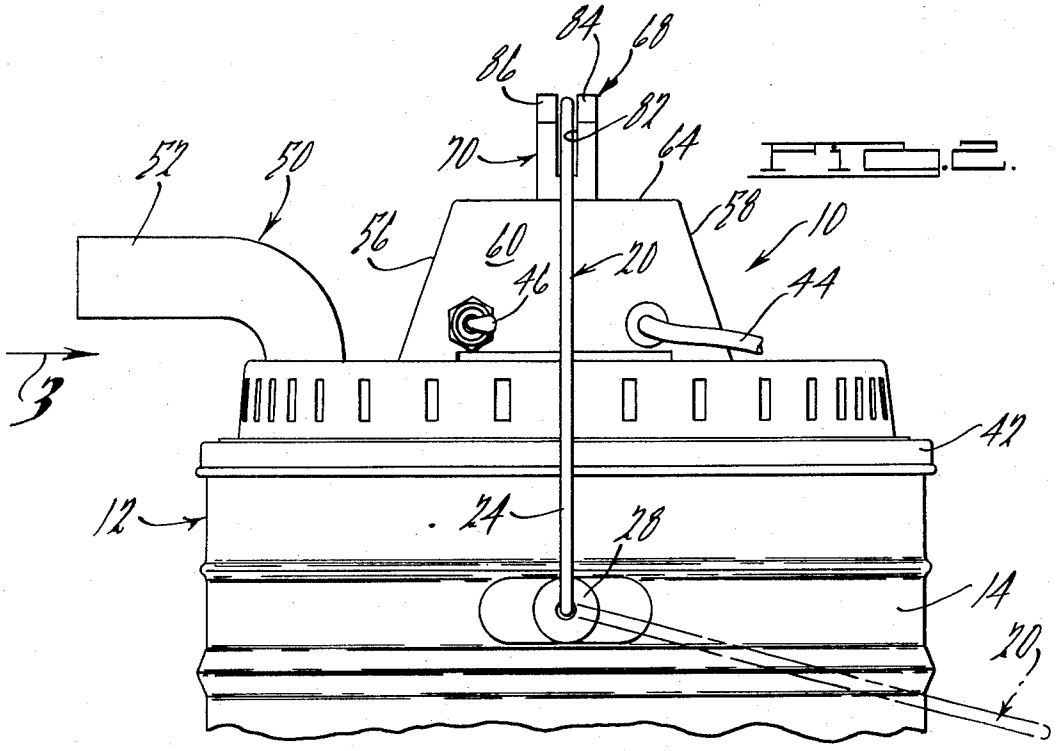

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FIG. 2.

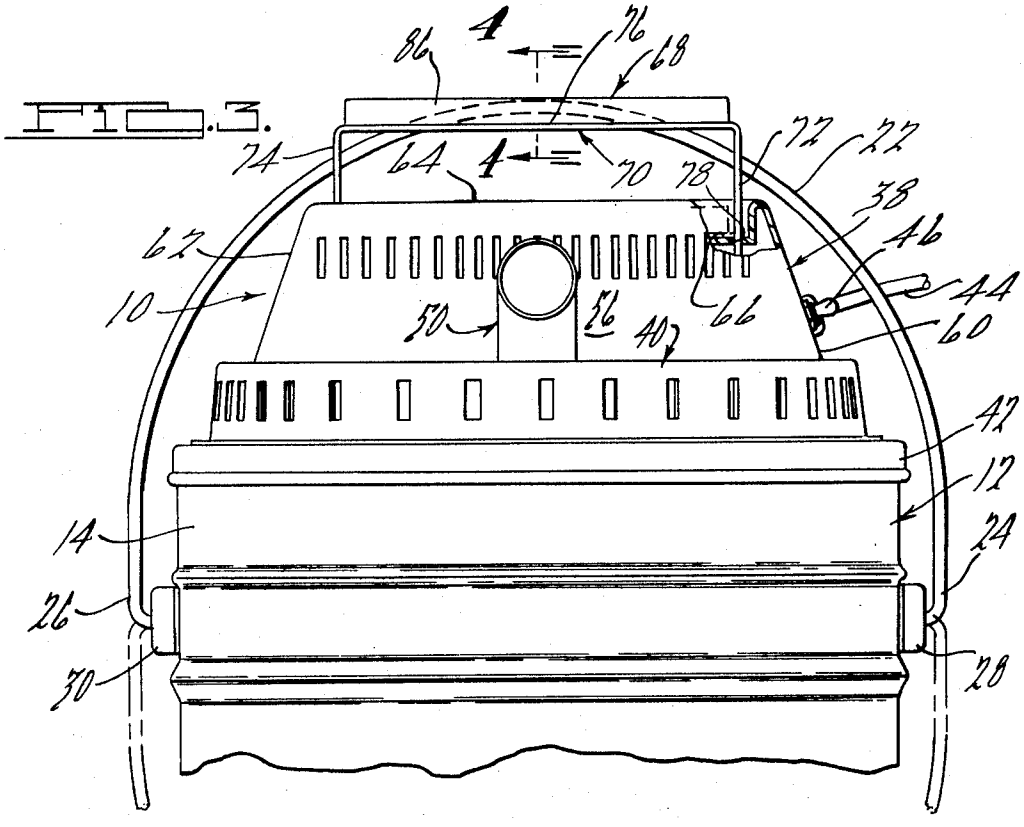

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FIG. 3.

VACUUM ASSEMBLY

SUMMARY OF THE INVENTION

Generally speaking, the present invention relates to vacuum cleaning apparatus of the type used for removing or vacuuming foreign materials, such as dirt, moisture and the like. More particularly, the present invention is directed toward a new and improved vacuum cleaning assembly which is adapted for operative association with a container, such as a pail, bucket or the like, in a manner such that the container functions as the receptacle for the foreign material which is picked up or "vacuumed" upon operation of the assembly.

It is accordingly a general object of the present invention to provide a new and improved vacuum cleaning apparatus.

It is a more particular object of the present invention to provide a new and improved vacuum cleaning apparatus that is adapted for operative association with conventional pails, buckets and the like which will function as a receptacle for receiving foreign materials picked up by the apparatus.

It is another object of the present invention to provide a new and improved vacuum apparatus of the above character that incorporates a novel handle arrangement which is cooperable with the handle or bail normally provided on buckets or pails in a manner so as to permit simultaneous manual grasping or engagement of the two handles, whereby to permit concomitant transport of the vacuum apparatus and associated container as a composite unit or structure.

It is yet another object of the present invention to provide a new and improved vacuum apparatus of the above character where the handle provided thereon is movable between an upper extended position and a lower retracted position, and wherein the upper end of the vacuum housing is defined in part by a generally horizontal plane, whereby to permit the entire assembly to be inverted and be supported upon the flat upper surface thereof without interference with the handle for purposes of inspection, repair and the like of the operating mechanism located on the underside of the assembly.

It is still another object of the present invention to provide a new and improved vacuum apparatus of the above character which will find universality of application with a wide variety of different styles of containers, buckets, pails and the like.

It is a further object of the present invention to provide a new and improved vacuum assembly which in a relatively simple design, is economical to manufacture and will have a long and effective operational life.

Other objects and advantages of the present invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an elevated exploded view of the vacuum assembly of the present invention, as shown in operative association with the conventional container such as a bucket, pail or the like;

FIG. **2** is an enlarged side elevational view of the vacuum assembly of the present invention as shown in its assembled position on the associated container;

FIG. **3** is another view of the structure shown in FIG. **2**, as taken in the direction of the arrow **3** thereof, and;

FIG. **4** is an enlarged fragmentary cross sectional view taken substantially along the line **4—4** of FIG. **3.**

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now in detail to the drawings and in particular to FIG. **1** thereof, a vacuum assembly **10,** in accordance with one preferred embodiment of the present invention, is shown generally in operative association with a container **12** which is adapted to function as a receptacle for articles vacuumed or picked up by the assembly **10.** As shown in FIG. **1,** the container **12** comprises a generally cylindrically shaped side wall **14** and is closed at the lower end thereof, as will be apparent. The container may, if deired, be mounted for rolling movement on a suitable container chassis **16** having rollable casters or the like **18** on the underside thereof. It will be appreciated, of course, that the container **12** may be of various other configurations than a right circular cylinder, as shown herein, for example, the container **12** could consist of a frustoconically shaped bucket, pail or the like well known in the art.

The container **12** is provided with a handle or bail, generally designated by the numeral **20,** which is of a U-shaped configuration and comprises an arcuate central portion **22** having diametrically opposed end portions **24** and **26** at the opposite ends thereof. The end portions **24, 26** are adapted for pivotal engagement with a pair of attachment fittings **28, 30,** respectively, which are located on the diametrically opposite sides of the container **12,** as best seen in FIG. **3.** The container **12,** and in particular, the cylindrical side wall **14** thereof, defines a generally circular shaped upper marginal edge **32** and an interior chamber **34.** As will hereafter be described in detail, the vacuum assembly is adapted to be mounted on the upper marginal edge **32** so as to close the top of the chamber **34** and provide a generally air tight volume therewithin. Upon energization of the vacuum assembly **10,** the chamber **34** will have a reduced pressure condition existing therein relative to the ambient pressure exteriorly of the container **12,** whereupon foreign material such as dirt, liquids or the like may be transferred via a suitable suction hose (not shown) into the container **12.**

The vacuum assembly **10** comprises an assembly housing, generally designated by the numeral **36,** which consists of an upper, generally trapezoidal shaped housing section **38** and a lower annular or circular shaped housing section **40.** Extending around the outer periphery of the lower housing section **40** is a peripheral lip element **42** which is adapted to be surmounted upon the upper edge **32** of the container **12** and form a generally air tight seal therewith. It will be appreciated, of course, that the lower housing section **40** may be of various other configurations either complimentary to or different from the size and shape of the associated container **12,** provided, however, that a suitable air tight seal is provided between the underside of the housing **36** and the associated container. Disposed interiorly of the vacuum assembly housing **12** is a suitable electrically energizable motor (not shown) which is adapted to be communicable with a source of electrical energy by means of a conductor **44** connected to a suitable electrical circuit by means of a manually operated "on-off" switch **46** mounted on the side of the upper housing section **38,** as illustrated. The underside of the vacuum assembly **10** is provided with a filtering ele-

ment, representatively designated by the numeral **48,** which is intended to prevent foreign material introduced into the chamber **34** from adversely affecting the normal operation of the vacuum motor therewithin. The assembly **10** is provided with a vacuum conduit **50** which is depicted as being generally L-shaped and comprising an upper generally horizontally disposed inlet section **52** and a lower vertically oriented outlet section **54.** Upon mounting the vacuum assembly **10** upon the container **12,** the outlet end **54** of the conduit **50** will be disposed interiorly of the air tight chamber **34.** Accordingly, at such time that the aforesaid vacuum motor is energized, a suitable reduction in pressure will occur within the container **12,** thus creating a pressure differential between the interior and exterior thereof. Means in some form of a suitable vacuum conduit or hose may be connected to the inlet end **52** of the conduit **50** for use in directing the reduced pressure condition within the container **12** toward a position adjacent or in confronting relation with the foreign material, i.e., dirt, liquids or the like, which is to be vacuumed by the assembly **10.** Accordingly, due to the reduced pressure condition which exists within the container **12,** the foreign material will be ingested into the aforesaid conduit and eventually will be transferred thereby to the inlet end **52** of the conduit **50** and will thereafter be communicated via the outlet end **54** into the interior of the container **12** where same will be accumulated. A suitable float operated stopper may be provided interiorly of the assembly **10** for automatically closing the air flow path to the vacuum motor to prevent water, dirt or other foreign substances from being drawn up into the rotors of the vacuum turbine powered by the motor. It will be noted that the vacuum assembly **10** will find particularly useful application in removing liquids, such as cleaning water and the like from floors, as well as for picking up dirt and the like therefrom, although it will be appreciated that the assembly **10** will find wide and varied use other than these specific applications.

The upper vacuum housing section **38** is formed with a pair of upwardly and inwardly inclined side wall portions **56** and **58** and with a pair of upwardly and inwardly inclined end wall portions **60** and **62.** The wall portions **56–62** terminate at the upper end thereof in a generally flat top section **64** that is defined in part by an imaginary, generally horizontal plane. The central portion of the top section **64** is formed with a generally rectangular shaped recessed area **66** which is adapted to nestingly receive a vertically movable or retractable carrying handle, generally designated by the numeral **68** and which is constructed in accordance with the principles of the present invention. More particularly, the handle **68** is adapted to be moved vertically between an upper extended position, as seen by the solid line position in FIG. **3,** and a lower retracted position (shown in dotted lines in FIG. **3**) wherein the handle is recessed below the top section **64.** The handle **68** comprises a generally U-shaped member **70** fabricated, for example, of a strip of steel or the like and includes a pair of vertically disposed, spaced parallel end sections **72** and **74** that are integrally connected by a generally horizontally disposed top section **76.** The recessed area **66** is formed with a pair of spaced apart slots or openings **78** and **80** at the opposite ends thereof which are arranged in generally vertical registry or alignment with the end sections **72, 74** of the member **70** and through which the lower ends of the end sections **72, 74** extend. Suitable stop means (not shown) are provided on the lowermost portions of the end sections **72, 74** which are disposed below the recessed area **66,** which stop means are adapted to engage the underside of the recessed area **66** to limit outward movement of the handle **68.** The length of the end sections **72, 74** and the distance which the recessed area **66** is located below the horizontal plane defining the top **64** are such that when the handle **68** is disposed in its lower retracted position, the same is entirely below the plane defining the top **64,** for purposes hereinafter to be described.

In accordance with one feature of the present invention, the handle **68** is formed with elongated cut-away slot **82** extending the entire length thereof. The handle **68** is also provided with a pair of handle members, generally designated by the numeral **84,** which are adapted to be fixedly secured to the top section **76** adjacent the opposite sides of the cut-away slot **82,** whereby to define an elongated recessed area adapted to nestingly receive the arcuate central portion **22** of the handle or bail **20.** Accordingly, the bail **20** and handle **68** may be simultaneously manually grasped or engaged to permit the entire assemblage consisting of the vacuum assembly **10** and container **12** to be transported as a single composite unit. More particularly, at such time as it is desired to effect transport of the aforesaid assemblage, the bail **20** can be pivoted from its normally stored position, as shown in FIG. **1,** to an upwardly disposed position, as shown in FIGS. **2** and **3.** Thereafter, the handle **68** may be raised from its lower or retracted position in FIG. **3** to its upper extended position. As the handle **68** moves upwardly beneath the bail **20,** the recess defined between the handle members **84** and the cut-away slot **82** receives the central portion **22** of the bail **20,** as best seen in FIGS. **2** and **3.** Accordingly, it is possible to manually grasp both of the handles **68** and bail **20** simultaneously and transport the vacuum assembly **10** and container **12** as a single or composite structure. This is extremely important in that the assemblage may be transported through the use of only a single arm or hand of the operator instead of having to use both arms as is necessary when the vacuum assembly **10** and container **12** are separated or disassembled. At such time as the assemblage has been moved to some predetermined destination, the handle **68** may be biased downwardly to its retracted position recessed below the surface of the top **64,** and the bail **20** may be again moved to its inoperative position shown, for example, in FIG. **1.**

Another feature of the present invention resides in the fact that the top **64** is of a flat, horizontal configuration, and that the handle **68** is recessed entirely therebelow when it is in its retracted position. Accordingly, the entire vacuum assembly **10** may be inverted and rested or supported on a suitable flat surface so that access may be provided into the interior thereof, for example, for adjusting, repairing the filter element **48** and/or safety switches or the like located in the interior thereof. Still another feature of the present invention resides in the fact that the vacuum assembly **10** is of an extremely compact construction and is thus lightweight and easy to handle. Additionally, the assembly **10** will find universality of application due to the fact that it may be operatively associated with the various type containers other than the container **12** depicted herein, as will be appreciated by those skilled in the art.

While it will be apparent that the preferred embodiment of the invention disclosed are well calculated to fulfill the objects above stated, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope or fair meaning of the subjoined claims.

We claim:

1. In combination in a vacuum assembly, an open upper-ended container having a first manually engageable handle thereon,

a vacuum subassembly including a housing having an inlet and an outlet,

an electrically energized vacuum motor within said subassembly, and

a second manually engageable handle on said subassembly,

said subassembly being supportable adjacent the upper end of said container and define with the container a discharge chamber communicable with said outlet,

said first and second handles being movable to a position wherein they are generally aligned with each other when said subassembly is assembled onto said container, whereby said first and second handles may be concomitantly manually grasped in order to transport said assembly.

2. The invention as set forth in claim **1** wherein said first handle is pivotally secured to said container, and wherein said second handle is retractably mounted on said vacuum subassembly.

3. The invention as set forth in claim **2** wherein said first handle is of a generally U-shaped configuration having a central portion and opposed end portions pivotally connected to the opposite sides of said container.

4. The invention as set forth in claim **2** wherein said second handle is movable between an upper extended position and a lower retracted position, and wherein said upper extended position is generally coincident with said first handle to permit simultaneous manual engagement of said first and second handles.

5. The invention as set forth in claim **4** wherein said second handle is formed with an elongated recessed area arranged generally parallel to said first handle and adapted to nestingly receive said central portion of said first handle.

6. The invention as set forth in claim **4** wherein said vacuum housing comprises an uppermost portion defined in part by a generally horizontally extending plane, and wherein said upper extended position of said second handle is located above said plane and said lower retracted position of said second handle is disposed below said plane, whereby said vacuum housing may be inverted so that same may be supported upon said uppermost portion thereof without interference with said second handle means.

7. The invention as set forth in claim **1** wherein said container is of a generally cylindrical configuration having an open upper end.

8. The invention as set forth in claim **1** which includes a radially disposed portion on said vacuum subassembly adapted for sealing engagement with the upper end of said container and cooperable therewith in defining a generally air tight chamber therewithin.

9. A composite structure including a generally open upper-ended container and an operating mechanism cooperable with the container to perform an operation, said structure including means supporting the mechanism adjacent the upper end of the container,

first handle means including a generally U-shaped bail having a central portion and opposite end portions secured to the container, and

second handle means mounted on the operating mechanism, said second handle means being movable between an upper extended position and a lower retracted position, said upper extended position being generally coincident with said first handle means so that said first and second handle means are positionable wherein they are substantially aligned with each other when said mechanism is supported on said container, whereby said first and second handle means may be singlehandedly simultaneously grasped to permit concomitant transport of the container and operating mechanism.

10. The invention as set forth in claim **9** wherein said operating mechanism comprises a vacuum assembly.

11. The invention as set forth in claim **10** wherein said means supporting the mechanism comprises a radially disposed portion of said vacuum assembly adapted for sealing engagement with the upper end of said container and cooperable therewith in defining a generally air tight chamber therewithin.

12. The invention as set forth in claim **9** wherein said second handle means is formed with an elongated recessed area arranged generally parallel to said first handle means and adapted to nestingly receive said central portion of said first handle means.

13. The invention as set forth in claim **12** wherein said mechanism consists of a vacuum assembly and includes a vacuum housing comprising an uppermost portion defined in part by a generally horizontally extending plane, and wherein said upper extended position of said second handle means is located above said plane and said lower retracted position of said second handle means is disposed below said plane, whereby said vacuum housing may be inverted so that same may be supported upon said uppermost portion thereof without interference with said second handle means.

14. The invention as set forth in claim **9** wherein said container is of a generally cylindrical configuration having an open upper end.

15. A vacuum assembly adapted for operative association with a generally open upper-ended container having a first manually engageable handle thereon,

said assembly including a housing and means for supporting said housing adjacent the upper end of the container,

said housing having an upper portion defined in part by an imaginary horizontal plane,

a second manual engageable handle on said assembly,

said second handle being movable between a retracted position located below said plane and an extended position located above said plane, whereby said second handle may be moved from said retracted position to said extended position to enable manual engagement therewith for transporting said assembly, and wherein said assembly may be inverted and be supported on said upper portion of said housing without interference with said handle means,

said second handle being positionable when said vacuum assembly is mounted on said container such

that both said first and second handles can be singlehandedly simultaneously grasped in order to transport said assembly and said container.

16. The invention as set forth in claim **15** wherein said container is of a generally cylindrical configuration having an open upper end.

17. The invention as set forth in claim **16** wherein said means supporting said assembly comprises a radially disposed portion adapted for sealing engagement with the upper end of said container and cooperable therewith in defining a generally air tight chamber therewithin.

18. The invention as set forth in claim **15** wherein said second handle is movable upwardly and downwardly along a path arranged at generally right angles to said plane.

19. The invention as set forth in claim **15** wherein said first handle is pivotally secured to said container.

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