United States Patent [19]

Champayne

[11] **3,826,045**

[45] **July 30, 1974**

[54] **ABRADING MACHINE WITH DUST COLLECTING UNIT**

[76] Inventor: **Roy J. Champayne,** c/o National Detroit, Inc., 2810 Auburn St., Rockford, Ill.

[22] Filed: **Sept. 14, 1973**

[21] Appl. No.: **397,260**

[52] **U.S. Cl.** ..... **51/170 T,** 51/273

[51] **Int. Cl.**..... **B24b 23/00**

[58] **Field of Search** ..... 51/170 T, 170 MT, 170 R, 51/273

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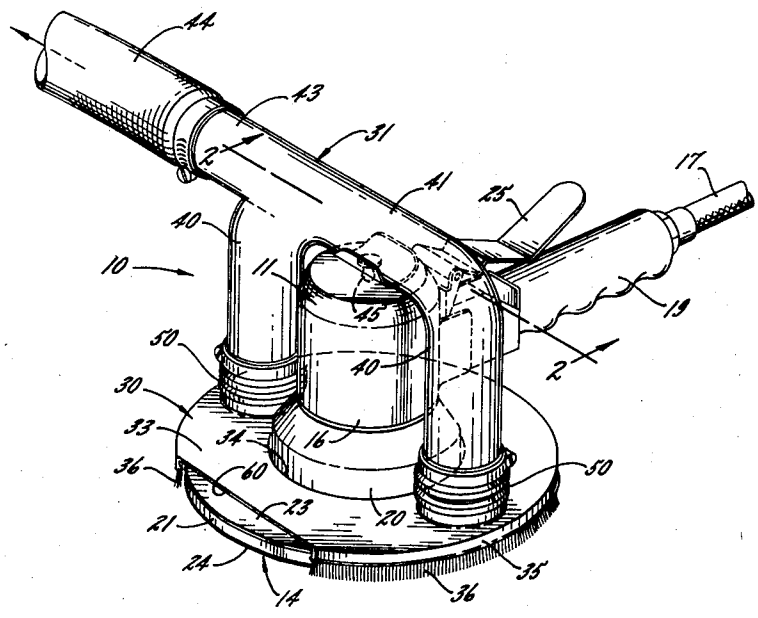
Primary Examiner—James L. Jones, Jr.

Attorney, Agent, or Firm—Wolfe, Hubbard, Leydig, Voit & Osann

[57] **ABSTRACT**

A vacuum unit removes abrading dust through a suction line communicating with a dust confining shroud which overlies and extends around the abrading pad of the machine. The shroud is telescoped rotatably over the motor unit of the machine and is suspended from the suction line which, in turn, is pivotally supported on top of the motor unit and is adapted to be turned relative to the handle of the machine to enable maneuvering of the machine without interference from the suction line.

6 Claims, 2 Drawing Figures



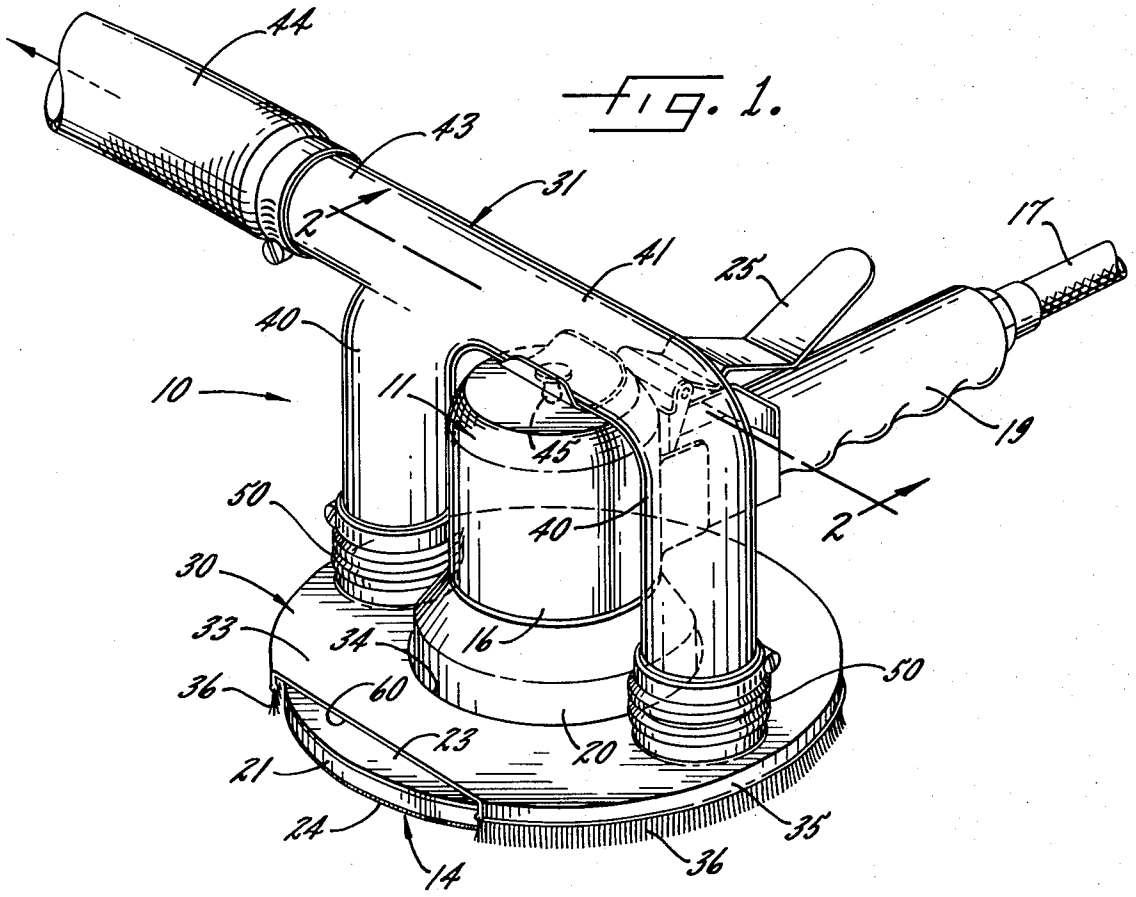

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FIG. 1.

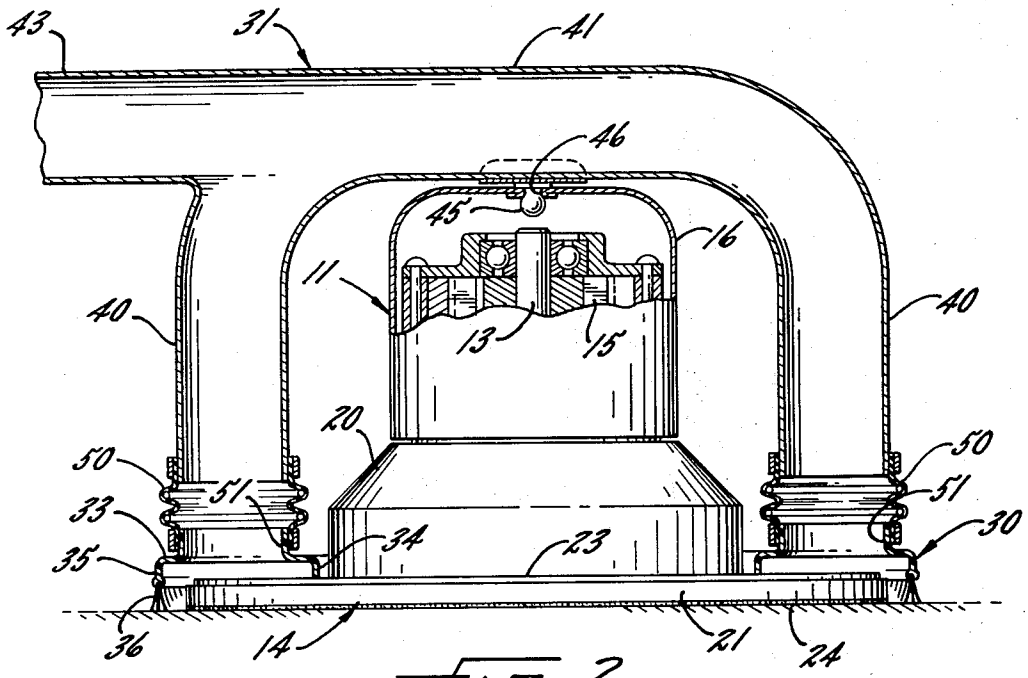

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FIG. 2.

ABRADING MACHINE WITH DUST COLLECTING UNIT

BACKGROUND OF THE INVENTION

This invention relates to a portable abrading or sanding machine having a motor unit with a rotary shaft which drives a generally circular sanding pad with either rotary motion or compound orbital and rotary motion, there being a handle projecting outwardly from the motor unit to facilitate maneuvering of the sander. More particularly, the invention relates to a sander of the type in which a dust collecting shroud overlies and extends around the sanding pad and supports a suction line which communicates with the interior of the shroud. Dust created during the sanding operation is confined within the shroud and is continuously sucked out of the shroud by a vacuum unit connected to the suction line.

SUMMARY OF THE INVENTION

One of the aims of the present invention is to provide a sander having a new and comparatively simple dust collecting unit which, when compared with prior arrangements of the same general type, enables the sander to be maneuvered more freely and with less interference by the shroud and the suction line.

A more detailed object is to achieve the foregoing through the provision of a novel dust collecting unit in which the suction line is pivotally supported on the top of the motor unit and may be turned to various angular positions relative to the outwardly projecting handle so as to enable the sander to be located in the best position for sanding without being obstructed or encumbered by the suction line.

A further object is to utilize the suction line for supporting the shroud on the sander and to take advantage of this arrangement to enable turning of the shroud to different angular positions relative to the handle for the purpose of exposing different peripheral portions of the sanding pad through an opening in the shroud, the exposed portion of the pad being capable of sanding within a corner or the like without interference by the shroud.

Still another object is to locate the suction line for use as a hand rest for applying pressure to the sanding pad and also for use as an auxiliary handle.

The invention further resides in the novel manner of mounting the shroud and the suction line for universal swivelling on the motor unit and for quick and easy detachment from the motor unit.

These and other objects and advantages of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a new and improved sanding machine incorporating the novel features of the present invention.

FIG. 2 is a fragmentary cross-section taken substantially along the line 2—2 of FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in the drawings for purposes of illustration, the invention is embodied in a portable abrading machine or sander **10** having a motor unit **11** with a rotary drive shaft **13** for driving a sanding pad **14**. In this instance, the pad is driven with a combined rotary and orbital motion but it will be appreciated by those familiar with the art that the pad could be driven with various other combinations of motions or with rotary motion only.

In the present instance, the motor unit **11** comprises a rotary air motor **15** (FIG. 2) encased within an inverted cup-shaped housing **16** and receiving air under pressure through a flexible hose **17** (FIG. 1) connected to the free end of a handle **19** and communicating with the motor through an air passage in the handle. The drive shaft **13** projects downwardly from the lower end of the housing and into a carrier **20** to which the abrading pad **15** is attached, the pad comprising a circular elastomeric disc **21** sandwiched between a metal plate **23** and a sheet **24** of abrading paper such as sandpaper. Suitable mechanism (not shown) is housed within the carrier and is connected between the latter and the shaft **13** to cause orbiting and rotation of the carrier and the attached sanding pad when the shaft is rotated.

As shown in FIG. 1, the handle **19** is anchored to and projects outwardly from one side of the motor housing **16** and carries a lever **25** which may be depressed to open a valve (not visible) and thus enable pressurized air to flow to the motor **15**. When the pad **14** is pressed against a work surface, the handle **19** may be grasped and the entire motor unit **11** may be turned relative to the pad about an axis generally coinciding with that of the shaft **13**.

To protect the operator of the sander **10** from abrading dust and to reduce the amount of dust in the work area, a dust collecting shroud **30** overlies and encircles the sanding pad **14** and communicates through a suction line **31** with a vacuum unit (not shown) operable to suck dust from the shroud. As shown in FIG. 2, the shroud comprises a ring-like member telescoped over the motor unit **11** and formed with a generally horizontal top wall **33**, with an inner depending skirt **34** and with an outer depending skirt **35**. The shroud is formed of flexible but self-sustaining plastic and preferably is transparent to enable the operator to see the peripheral edge of the sanding pad **14** during the sanding operation.

The top wall **33** of the shroud **30** is spaced approximately ¼ inch above the pad **14** while the lower edge of the inner skirt **34** rests lightly on the top of the pad to establish a seal between the pad and the interior of the shroud. The outer skirt **35** is spaced outwardly about ¼ inch from the peripheral edge of the sanding pad **14** and, as shown in FIG. 2, supports a ring of flexible bristles **36** which form a continuation of the outer skirt. When suction is applied to the shroud, the brushes seal against the work but not so tightly as to impede movement of the sander **10** or to cause the suction to lock the sander to the work. The brushes also serve to confine the dust within the shroud and to loosen dust which tends to cling to the surface of the work so that such dust may be exhausted through the suction line **31**.

In accordance with the primary aspect of the present invention, the shroud **30** and the suction line **31** are supported on the sander **10** in a novel manner which permits turning of the suction line to various angular positions relative to the handle **19** so that the suction

line may be easily moved to an out-of-the-way position and enable unencumbered maneuvering of the sander within confined areas such as corners or the like. This is achieved by mounting the suction line pivotally on the top of the motor unit **11**, by suspending the shroud from the suction line and by permitting the shroud to turn relative to the motor unit. With this arrangement, the suction line may be turned relative to the handle and to a position which is the most convenient and less obstructive for the operator at any given time.

More specifically, the suction line **31** herein comprises a generally U-shaped metal pipe having two generally vertical portions **40** and a substantially horizontal portion **41**. The horizonal portion **41** overlies the top of the motor housing **16** and is formed with an extension **43** which projects outwardly beyond one of the vertical portions **40** and which is connected to a flexible hose **44** leading to the vacuum unit.

To support the suction line **31** pivotally on the sander **10**, a pivot connection in the form of a ball **45** (FIG. 2) is anchored to the underside of the horizontal portion **41** and is adapted to telescope with a snap fit into a hole or socket **46** formed in the top wall of the motor housing **16** in vertical alinement with the shaft **13**. The ball preferably is made of resiliently yieldable plastic and, when pressed into the socket, is compressed inwardly by the rounded upper edge of the socket and then snaps outwardly below the edge. By virtue of the ball, the suction line **31** is capable of pivoting relative to the motor unit **11** about a vertical axis coinciding generally with the axis of the shaft **13** and also is capable of limited rocking about a horizontal axis.

The two vertical portions **40** of the suction line **31** are spaced diametrically around the shroud **30** and preferably communicate with vertically flexible hoses **50** which, in turn, communicate with the interior of the shroud through the top wall **30** thereof. At their lower end, the vertical portions **40** are telescoped within and anchored to the hoses **50** while the latter are anchored securely to short tubes **51** formed integrally with the top wall **33**. The shroud thus is suspended from the vertical portions **40** of the suction line **31** and is supported on the motor unit **11** solely by the pivot connection **45**. As shown in FIG. **2**, the inner skirt **34** of the shroud is spaced outwardly from the carrier **20** and thus the shroud is free to turn relative to the motor unit **11** when the suction line is swivelled horizontally.

With the foregoing arrangement, the operator may swivel the suction line **31** horizontally to different angular positions relative to the handle **19** and thus may move the suction line and the hose **44** to positions in which they present a minimum encumberance either to the hands and arms of the operator or to placement of the sander **10** in the most advantageous position with respect to the work. Accordingly, the sander may be maneuvered more freely without being obstructed by the suction line and the hose. By virtue of the ball **45** and the vertically flexible hoses **50**, the shroud **30** may rock slightly in a vertical direction to facilitate movement of the sander over curved or irregular surfaces. If it is necessary to remove the shroud to sand a given area, such removal can be easily effected by snapping the ball **45** out of the socket **46** and lifting the shroud and the suction line from the sander **10** as a unit. When the suction line is attached to the sander, the section of the horizontal portion **41** overlying the motor unit **11** forms a convenient rest pad upon which the operator may place his hand to apply downward pressure to the sanding pad. Also, the horizontal portion **41** and the outwardly projecting extension **43** thereof provide an auxiliary handle which the operator may use in conjunction with the handle **19** for the purpose of maneuvering the sander.

If desired, an opening **60** (FIG. 1) may be formed in one side of the shroud **30** by interrupting part of the outer skirt **35** and the top wall **33**. As a result of the opening **60**, a portion of the peripheral edge of the sanding pad **14** is completely exposed and may abrade a work surface directly adjacent a corner or right angular wall without being held away from the wall by the outer skirt **35**. With the shroud being turnable on the motor unit **11** and with the motor unit being turnable relative to the pad, the opening **60** may be turned to various positions relative to the handle **19** and thereby enable the operator to locate the opening in the most advantageous position to expose the portion of the sanding pad capable of best reaching the work.

I claim as my invention:

1. An abrading machine comprising a motor unit having a rotary drive shaft at its lower end and having a handle projecting outwardly from one of its sides, a generally circular abrading pad connected to be driven by said shaft, a dust collecting shroud telescoped rotatably over said motor unit, said shroud having a top wall overlying the upper side of said pad and having a depending skirt extending around the outer periphery of said pad, a suction line having a generally vertical portion communicating with the interior of said shroud through said top wall and having a generally horizontal portion overlying the top of said motor unit, and means connecting said horizontal portion to the top of said motor unit for pivoting about a generally vertical axis thereby to support said shroud on said motor unit while enabling turning of said suction line and said shroud relative to said motor unit and said handle.

2. A sanding machine as defined in claim **1** in which said suction line includes a second generally vertical portion communicating with said horizontal portion and communicating with the interior of said shroud through said top wall, the first and second vertical portions of said suction line being spaced diametrically from one another around said shroud.

3. A sanding machine as defined in claim **1** in which an opening is formed in part of said top wall and said skirt to expose part of the periphery of said sanding pad, said opening turning to different angular positions relative to said handle when said suction line and said shroud are turned relative to said motor unit.

4. A sanding machine as defined in claim **1** in which the vertically extending portion of said suction line includes a vertically flexible section to enable vertical rocking of said shroud relative to said pad.

5. A sanding machine as defined in claim **1** in which an upwardly opening hole is formed in the top of said motor unit, said means comprising a pivot connection anchored to and depending from the horizontal portion of said suction line and releasably telescoped into said hole with a snap fit.

6. A sanding machine as defined in claim **1** in which said means also support said suction line and said shroud on said motor unit for rocking about a generally horizontal axis.

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