



(11)

**EP 1 640 115 A1**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**29.03.2006 Bulletin 2006/13**

(51) Int Cl.:  
**B24B 55/10 (2006.01) B24B 23/00 (2006.01)**

(21) Application number: **05019855.5**

(22) Date of filing: **13.09.2005**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI  
SK TR**  
Designated Extension States:  
**AL BA HR MK YU**

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(30) Priority: **22.09.2004 US 612201 P**  
**06.09.2005 US 220355**

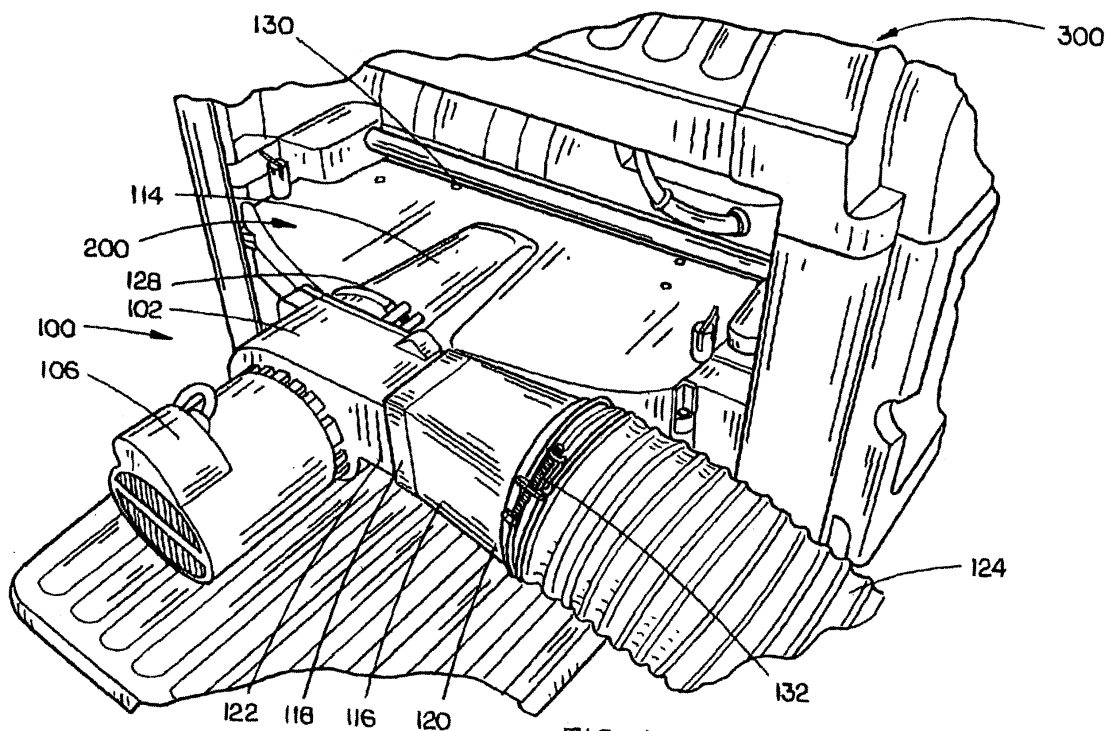
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(54) **Dust collection system**

(57) An auxiliary dust collection system includes a housing configured for substantially directly coupling to a dust hood of a dust and debris-generating power tool. The auxiliary dust collection system further includes a blower assembly contained within the housing. The blower assembly is configured to both draw dust and debris generated by the power tool into the housing and to vent

the dust and debris from the housing. A motor is contained within the housing and is operably coupled with the blower assembly. The motor is sized and dedicated for powering the blower assembly and is further capable of electrically coupling to a standard electrical supply. The auxiliary dust collection system is configured for venting solely the dust and debris-generating power tool.



**FIG. 1**

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## Description

**[0001]** The present invention relates to the field of power tools, and particularly, to a dust collection system for use with a portable planer. Of course, the present invention is not limited to any particular type of power tool.

**[0002]** Portable planers are useful tools for any workshop. However, like many power tools, portable planers can generate significant amounts of dust and debris, such as wood chips or shavings, during use. Therefore, a number of systems have been developed for use with portable planers for collecting said dust and debris. Currently available dust collection systems may include a dust hood, which a user couples with the portable planer, for capturing dust and debris. The dust hood will typically include a vacuum attachment, such as for connecting a vacuum hose of a central vacuum system. These systems rely on suction force provided by the vacuum to draw dust and debris from the dust hood into a receptacle of the vacuum system. A drawback to this system is that the dust hood and vacuum system may not be included with the portable planer and thus, may have to be purchased as separate accessories and connected with the portable planer by the user. Further, such vacuum systems may take up a lot of space and may be relatively expensive.

**[0003]** In attempting to address the problems associated with the dust collection systems described above, a number of portable planers include built-in dust collection systems. The built-in systems include a dust hood coupled to the planer for capturing dust and debris generated during use of the planer. The dust hood typically includes a blower, which is powered by the planer's motor, for directing dust/debris into an attached bag or receptacle. Although these systems no longer require a user to purchase separate components, such as a vacuum unit, to direct dust/debris from the dust hood, they are not without problems. For instance, because they implement a blower that is powered by the planer motor, these built-in systems may experience problems with power draw. More specifically, many planer motors include a thermal overload for detecting when the motor becomes overheated. Upon detection of overheating, the thermal overload will trip the circuit breaker, thereby causing the portable planer to shut down. With the built-in dust collection systems, because the planer motor has to power both the portable planer and the blower of the dust hood, it may be vulnerable to overload. This may be especially true if, for example, the portable planer is set to a relatively large depth of cut. Therefore, a user may have to limit the planer's depth of cut in order to avoid overloading the planer motor and causing shut down. The end result is that the user is not getting optimal performance from the portable planer because the capabilities of the portable planer must be limited to avoid overloading the planer motor.

**[0004]** Therefore, it would be advantageous to have a dust collection system integrated with a portable planer.

It would be further advantageous if the integrated dust collection system included a power source, independent from the planer motor, thereby improving performance over current systems by allowing a user to operate the portable planer without limiting its functionality.

**[0005]** Accordingly, a first aspect of the present invention is directed to an auxiliary dust collection system including a housing, a blower assembly, and a motor. The housing is configured for substantially directly coupling to a dust hood of a dust and debris-generating power tool. The blower assembly is contained within the housing. Further, the blower assembly is configured to both draw dust and debris generated by the power tool into the housing and to vent the dust and debris from the housing. The motor is contained within the housing and is operably coupled with the blower assembly. Further, the motor is sized and dedicated for powering the blower assembly and is also capable of electrically coupling to a standard electrical supply. The auxiliary dust collection system is configured for venting solely the dust and debris-generating power tool.

**[0006]** An additional aspect of the present invention is directed to an auxiliary dust collection system including a dust hood, a housing, a blower assembly, and a motor. The dust hood is configured for substantially directly coupling to a dust and debris-generating power tool. The housing is configured for substantially directly coupling to the dust hood. The blower assembly is contained within the housing. Further, the blower assembly is configured for venting solely the dust and debris-generating power tool by both drawing dust and debris generated by the power tool into the housing and venting the dust and debris from the housing. The motor is contained within the housing and is operably coupled with the blower assembly. Further, the motor is sized and dedicated for powering the blower assembly and is also capable of electrically coupling to a standard electrical supply. Additionally, the blower assembly is coupled to a drive shaft of the motor.

**[0007]** A further aspect of the present invention is directed to an auxiliary dust collection system for a portable planer, the system including a dust hood, a housing, a blower assembly, and a motor. The dust hood includes an inlet and an outlet formed therein. The inlet of the dust hood is configured for substantially directly coupling to the portable planer. The housing includes an inlet and an outlet formed therein. The inlet of the housing is configured for substantially directly coupling to the outlet of the dust hood. The blower assembly is contained within the housing. Further, the blower assembly is configured for venting solely the portable planer by drawing dust and debris generated by the portable planer into the housing, via the housing inlet, and venting the dust and debris from the housing, via the housing outlet. The motor is contained within the housing and is operably coupled with the blower assembly. Further, the motor is sized and dedicated for powering the blower assembly and is also capable of electrically coupling to a standard electrical supply. Additionally, the blower assembly is coupled to a

drive shaft of the motor and is configured to draw dust and debris into the housing in a first direction and to vent dust and debris from the housing in a second direction, the second direction being substantially perpendicular to the first direction.

**[0008]** It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not necessarily restrictive of the invention as claimed. The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate embodiments of the invention and together with the general description, serve to explain the principles of the invention.

**[0009]** The numerous advantages of the present invention are now described, with reference to the accompanying figures in which:

FIG. 1 is a top right perspective illustration of a portable planer including a dust collection system in accordance with an exemplary embodiment of the present invention;

FIG. 2 is a top left perspective illustration of a portable planer including a dust collection system in accordance with an exemplary embodiment of the present invention;

FIG. 3 is top plan view illustrating a blower assembly and motor assembly of the dust collection system in accordance with an exemplary embodiment of the present invention;

FIG. 4 is an isometric view illustrating a blower assembly and motor assembly of the dust collection system in accordance with an exemplary embodiment of the present invention;

FIG. 5 is a side view illustrating an inlet aperture of a blower assembly of the dust collection system in accordance with an exemplary embodiment of the present invention;

FIG. 6 is front plan view illustrating an outlet aperture of a blower assembly of the dust collection system in accordance with an exemplary embodiment of the present invention;

FIG. 7 is a perspective top plan view illustrating a blower assembly connected with a dust and debris transfer assembly in accordance with an exemplary embodiment of the present invention; and

FIG. 8 is a perspective bottom plan view illustrating a blower assembly connected with a dust and debris transfer assembly in accordance with an exemplary embodiment of the present invention.

**[0010]** Reference will now be made in detail to the presently preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings.

**[0011]** Referring generally now to FIGS. 1 through 8, exemplary embodiments of the present invention are shown.

**[0012]** In a first aspect of the present invention, an aux-

iliary dust collection system 100 includes a housing 102. The housing 102 is configured for substantially directly coupling to a dust hood 200 of a dust and debris-generating power tool 300. In an exemplary embodiment, the power tool 300 is a portable planer.

**[0013]** The auxiliary dust collection system 100 further includes a blower assembly 104. The blower assembly 104 is contained within the housing 102 and is configured to draw dust and debris generated by the portable planer 300 into the housing 102. Additionally, the blower assembly 104 is configured to vent the dust and debris from the housing 102.

**[0014]** The auxiliary dust collection system 100 further includes an auxiliary motor 106. The auxiliary motor 106 is contained within the housing 102 and is operably coupled with the blower assembly 104. In a current embodiment, the auxiliary motor 106 powers the blower assembly 104, thereby allowing the blower assembly to pull dust and debris into an inlet 110 of the housing 102. The dust and debris is then directed through the housing 102 by the auxiliary motor 106 and blower assembly 104 and is vented from an outlet 122 of the housing 102. In a present embodiment, the inlet 110 and outlet 122 of the housing 102 are apertures formed by the housing. In an exemplary embodiment, the auxiliary motor 106 is sized and dedicated for powering the blower assembly 104. In further embodiments, the auxiliary motor 106 is also capable of electrically coupling to a standard electrical supply.

**[0015]** The auxiliary dust collection system 100 of the present invention is connected with the portable planer 300 to assist in providing increased dust collection capabilities beyond that provided by dust collection systems currently employed with portable planers. By implementing an auxiliary motor 106 to power the blower assembly 104, the auxiliary dust collection system 100 of the present invention does not experience the power draw problems associated with current built-in dust collection systems, which are powered by the planer's motor. In an exemplary embodiment, the auxiliary dust collection system 100 is configured for venting solely the portable planer 300.

**[0016]** In further embodiments, the auxiliary dust collection system 100 includes a ground device 108, such as a ground wire coupled between the housing 102 and a metal component of the power tool 300. The ground device 108 is configured for preventing static buildup between the power tool 300 and the housing 102 of the auxiliary dust collection system 100.

**[0017]** In an exemplary embodiment, as shown in FIG. 1, the housing 102, the motor 106 and the blower assembly 104 of the auxiliary dust collection system 100 are configured for coupling with a dust hood 200 of a power tool 300, such that the dust hood 200, the housing 102, the motor 106 and the blower assembly 104 are in a substantially in-line orientation with respect to the power tool 300. This may allow for easier connection of component features of the system 100.

**[0018]** In additional embodiments, the inlet 110 formed

by the housing 102 includes a sleeve 112 configured for receiving and securing a correspondingly-shaped adapter 114 of a dust hood 200 for substantially directly connecting the dust hood 200 with the inlet 110 of the housing 102.

**[0019]** In a current embodiment, the auxiliary dust collection system 100 further includes a transfer adapter 116, the transfer adapter forming an inlet end 118 and an outlet end 120. The inlet end 118 of the transfer adapter 116 is configured for coupling with the outlet 122 formed by the housing 102. For example, the inlet end 118 of the transfer adapter 116 and/or the housing outlet 122 may be variously contoured to correspond with each other and to maximize flow through of dust and debris. In the current embodiment, the transfer adapter 116 is connected with the housing 102 by a plurality of hex head bolts. It is contemplated that various fasteners, such as pins, clips, screws, clamps, and the like may be employed to securely affix the transfer adapter 116 with the housing 102 of the auxiliary dust collection system 100. Alternatively, various mechanical connection mechanisms, such as a compression lock system, snap fit system, friction fit system, latch lock system, and the like may be employed to connect the transfer adapter 116 with the outlet 122 of the housing 102 without departing from the scope and spirit of the present invention. It is further contemplated that various adhesives, such as epoxy compounds, plastic cements, and the like may be used to connect the transfer adapter 116 with the outlet 122 of the housing 102. It is further contemplated that the housing outlet 122 includes a connection mechanism whereby the transfer adapter 116 is connected to the housing 102 in proximal relation to the housing outlet 122. The outlet end 120 of the transfer adapter 116 is configured for coupling with a dust transfer device 124.

**[0020]** In further embodiments, the auxiliary dust collection system 100 includes a dust transfer device 124. Preferably, the dust transfer device 124 is a flexible hose member configured for coupling with the transfer adapter 116. For example, the flexible hose member 124 may be secured with the outlet end 120 of the transfer adapter 116 via a clamping mechanism 132. The flexible hose member 124 directs dust and debris that has been exhausted from the outlet end 120 of the transfer adapter 116, via the housing outlet 122, away from the power tool 300. It is contemplated that various mechanical connections systems, fasteners, and/or adhesives, as previously described, may be utilized alone or in combination with one another to secure the connection of the dust transfer device 124 with the transfer adapter 116 without departing from the scope and spirit of the present invention.

**[0021]** In an additional aspect of the present invention, the auxiliary dust collection system 100 further includes a dust hood 200. The dust hood 200 is configured for substantially directly coupling to a dust and debris-generating power tool 300, such as a portable planer. Preferably, the dust hood 200 is a standard configuration, constructed to be connected with the portable planer 300

in a manner which allows for full operation of the portable planer. For example, the dust hood 200 may be connected to the frame of the portable planer 300. Preferably, the dust hood 200 connects with the portable planer 300 proximal to the planer's cutting device in order to maximize the dust collection capabilities of the dust hood 200. In a current embodiment, the dust hood 200 forms an inlet 130 which allows for the collection of the dust and debris generated by the cutting device of the portable planer 300. In further embodiments, the dust hood 200 is contoured so that the collected dust and debris is funneled toward an outlet 128 formed by the dust hood 200. Preferably, the outlet 128 is an aperture formed by the dust hood 200 from which dust and debris may be vented.

**[0022]** The auxiliary dust collection system 100 further includes a housing 102. The housing 102 is configured for substantially directly coupling to the dust hood 200. The dust hood 200 may be variously configured as contemplated by those of ordinary skill in the art. In the current embodiment, the dust hood 200 forms an enclosure, which as mentioned above, is generally contoured to funnel collected dust and debris towards the dust hood outlet 128. The dust hood outlet 128 is further constructed in a manner which allows it to be connected with the inlet 110 of the housing 102. Preferably, the dust hood outlet 128 includes an adapter 114 which connects with the housing 102. In further embodiments, as shown in FIG. 7, the housing inlet 110 may utilize a clamping mechanism 134 for securely affixing the housing inlet 110 to the dust hood outlet 128. Alternatively, the dust hood outlet 128 may include various mechanical connection systems and/or employ various fasteners, adhesives and the like to securely affix the dust hood outlet 128 to the housing 102. The configuration of the housing inlet 110 may also correspond with the configuration of the dust hood outlet 128. In a current embodiment, the dust hood outlet 128 is a generally cylindrical aperture and therefore the housing inlet 110 may be constructed as a generally cylindrical aperture to provide for secure connection and flow through for the dust and debris from the dust hood outlet 128 into and through the housing inlet 110.

**[0023]** The auxiliary dust collection system 100 further includes a blower assembly 104 and a motor 106 as discussed above. In an exemplary embodiment, the blower assembly is coupled to a drive shaft 126 of the motor 106, as shown in FIG. 5.

**[0024]** In a further aspect of the present invention, an auxiliary dust collection system 100 for a portable planer 300 includes a dust hood 200. The dust hood 200 has an inlet 130 and an outlet 128 formed therein, the inlet 130 of the dust hood being configured for substantially directly coupling to the portable planer 300. The auxiliary dust collection system further includes a housing 102. The housing 102 has an inlet 110 and an outlet 122 formed therein, the inlet 110 of the housing 102 being configured for substantially directly coupling to the outlet 128 of the dust hood 200. The auxiliary dust collection system 100 further includes a blower assembly 104. The

blower assembly 104 is contained within the housing 102 and is configured for venting solely the portable planer 300 by drawing dust and debris generated by the portable planer 300 into the housing 102, via the housing inlet 110. Further, the blower assembly 104 is configured for venting the dust and debris from the housing 102, via the housing outlet 122. The auxiliary dust collection system further includes a motor 106. The motor 106 is contained within the housing 102 and is operably coupled with the blower assembly 104. Further, the motor 106 is sized and dedicated for powering the blower assembly 104. Additionally, the motor 106 is capable of electrically coupling to a standard electrical supply. In an exemplary embodiment, as shown in FIG. 5, the blower assembly 104 is coupled to a drive shaft 126 of the motor 106 and is configured to draw dust and debris into the housing 102 in a first direction and to vent dust and debris from the housing 102 in a second direction, the second direction being substantially perpendicular to the first direction. This is advantageous in that dust and debris is vented away from the portable planer 300 in a direction that does not interfere with user access to the area of the planer where a workpiece exits.

**[0025]** It is contemplated that the auxiliary dust collection system 100 of the present invention may be various modular constructions. For example, in one embodiment, the dust hood 200, the housing 102, the blower assembly 104, the auxiliary motor 106, the transfer adapter 116, and the dust transfer device 124 may be provided as individual component features which may be connected. Various other combinations of separate and/or combined component features of the auxiliary dust collection system 100 may be utilized in a modular system without departing from the scope and spirit of the present invention. For example, this modularity may enable the housing 102, the blower assembly 104 and the auxiliary motor 106 of the present invention to be retro-fitted with existing dust hoods of various portable planers. This may assist in increasing the useful lifespan of the auxiliary dust collection system 100 for the portable planer 300 in that the modular component features of the may be removed and the various component features provided maintenance. Further, the auxiliary dust collection system of the present invention may assist in increasing the useful lifespan of the portable planer as it may be removed, maintained, and/or replaced without significant interference with or disassembly of the portable planer.

**[0026]** In additional embodiments, the auxiliary dust collection system 100 is unitary. For example, the auxiliary dust collection system 100 may be an integral system wherein the dust hood 200, the housing 102, the blower assembly 104, the motor 106, the transfer adapter 116 and the dust transfer device 124 are integrally connected with one another. The integral system may reduce manufacturing costs and appeal to consumers. Further, the integral system may also be specifically constructed for use with a particular power tool.

**[0027]** It is believed that the present invention and

many of its attendant advantages will be understood by the forgoing description. It is also believed that it will be apparent that various changes may be made in the form, construction and arrangement of the components thereof without departing from the scope and spirit of the invention or without sacrificing all of its material advantages. The form herein before described being merely an explanatory embodiment thereof. It is the intention of the following claims to encompass and include such changes.

## Claims

1. An auxiliary dust collection system, comprising:

a housing configured for directly coupling to a dust hood of a dust and debris-generating power tool,

a blower assembly contained within the housing, the blower assembly being configured to both draw dust and debris generated by the power tool into the housing and to vent the dust and debris from the housing; and

a motor contained within the housing, the motor being operably coupled with the blower assembly, the motor being sized and dedicated for powering the blower assembly, the motor being capable of electrically coupling to a standard electrical supply,

wherein the auxiliary dust collection system is configured for venting solely the dust and debris-generating power tool.

2. An auxiliary dust collection system, comprising:

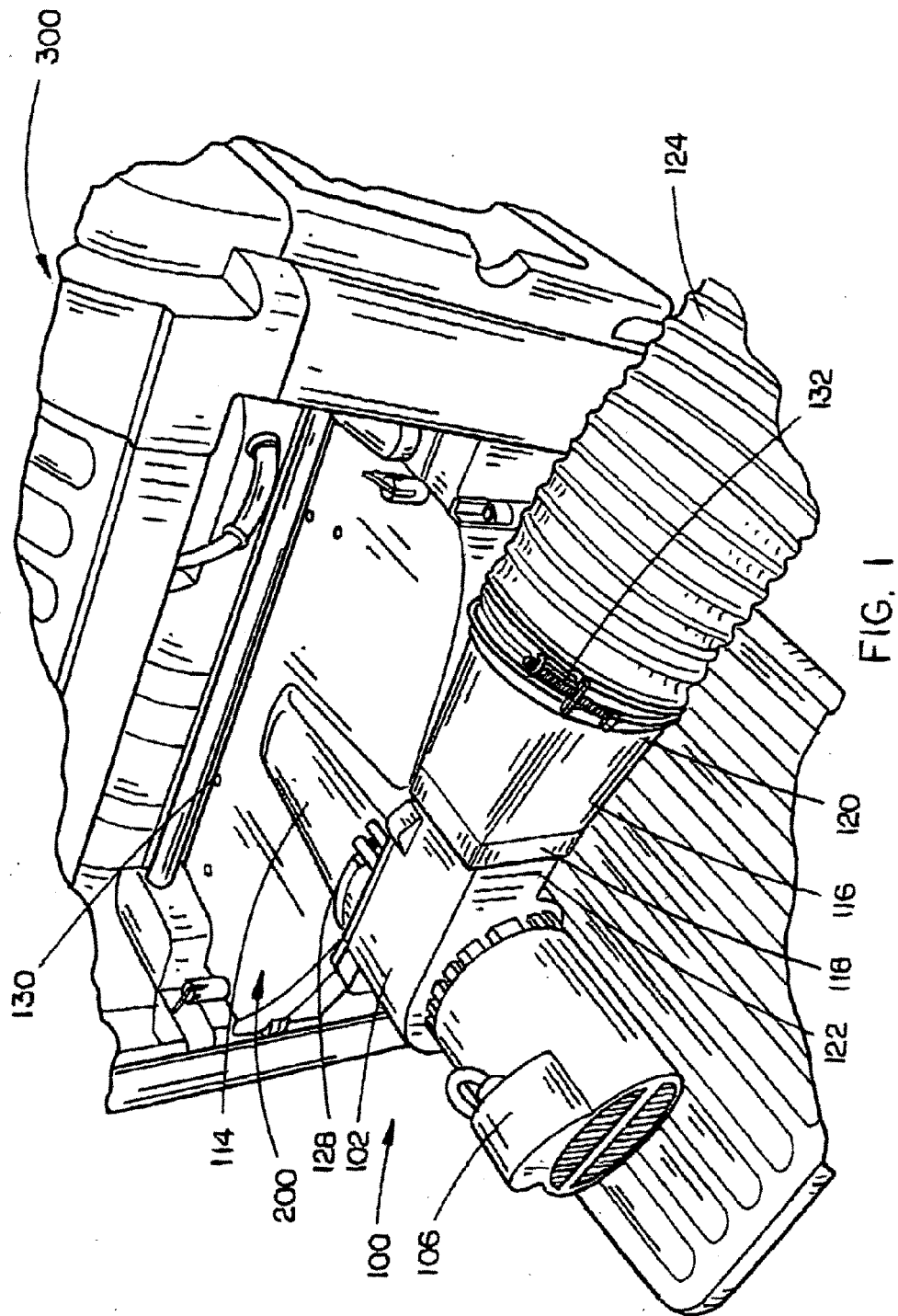
a dust hood being configured for directly coupling to a dust and debris-generating power tool; a housing configured for directly coupling to the dust hood;

a blower assembly contained within the housing, the blower assembly being configured for venting solely the dust and debris-generating power tool by both drawing dust and debris generated by the power tool into the housing and venting the dust and debris from the housing; and

a motor contained within the housing, the motor being operably coupled with the blower assembly, the motor being sized and dedicated for powering the blower assembly, the motor being capable of electrically coupling to a standard electrical supply, wherein the blower assembly is coupled to a drive shaft of the motor.

3. An auxiliary dust collection system for a portable planer, comprising:

- a dust hood having an inlet and an outlet formed therein, the inlet of the dust hood being configured for substantially directly coupling to the portable planer;
- a housing having an inlet and an outlet formed therein, the inlet of the housing being configured for substantially directly coupling to the outlet of the dust hood;
- a blower assembly contained within the housing, the blower assembly being configured for venting solely the portable planer by drawing dust and debris generated by the portable planer into the housing, via the housing inlet, and venting the dust and debris from the housing via the housing outlet; and
- a motor contained within the housing, the motor being operably coupled with the blower assembly, the motor being sized and dedicated for powering the blower assembly, the motor being capable of electrically coupling to a standard electrical supply,
- wherein the blower assembly is coupled to a drive shaft of the motor and is configured to draw dust and debris into the housing in a first direction and to vent dust and debris from the housing in a second direction, the second direction being substantially perpendicular to the first direction.
4. An auxiliary dust collection system as claimed in claim 1, 2 or 3 further comprising a ground wire coupled between the housing and a metal component of the power tool.
  5. An auxiliary dust collection system as claimed in claim 1, 2 or 3 wherein the housing, the motor and the blower assembly are configured for coupling with a dust hood of a power tool, such that the dust hood, the housing, the motor and the blower assembly are in an in-line orientation with respect to the power tool.
  6. An auxiliary dust collection system as claimed in claim 1, 2 or 3 wherein the housing forms an inlet having a sleeve configured for receiving and securing a correspondingly-shaped adapter of a dust hood for directly connecting the dust hood with the inlet of the housing.
  7. An auxiliary dust collection system as claimed in claim 1, 2 or 3 further comprising a transfer adapter, the transfer adapter forming an inlet end and an outlet end, the inlet end of the transfer adapter being configured for coupling with an outlet formed by the housing, the outlet end of the transfer adapter being configured for coupling with a flexible hose member.
  8. An auxiliary dust collection system as claimed in claim 7, further comprising a flexible hose member, the flexible hose member being configured for coupling with the transfer adapter and for directing dust and debris exhausted from the transfer adapter via the housing outlet away from the power tool.
  9. An auxiliary dust collection system as claimed in claim 8, wherein the auxiliary dust collection system is unitary.
  10. An auxiliary dust collection system as claimed in claim 1, 2 or 3, wherein an outlet formed by the dust hood includes an adapter for directly connecting with an inlet formed by the housing, the dust hood adapter being received and secured within a correspondingly-shaped sleeve of the housing inlet.
  11. An auxiliary dust collection system as claimed in claim 1, 2 or 3 wherein the outlet of the dust hood includes an adapter for directly connecting with the inlet of the housing, the dust hood adapter being received and secured within a correspondingly-shaped sleeve of the housing inlet.
  12. An auxiliary dust collection system as claimed in claim 11, further comprising a flexible hose member for connecting with the housing outlet, the flexible hose member for directing dust and debris exhausted from the housing outlet away from the power tool.



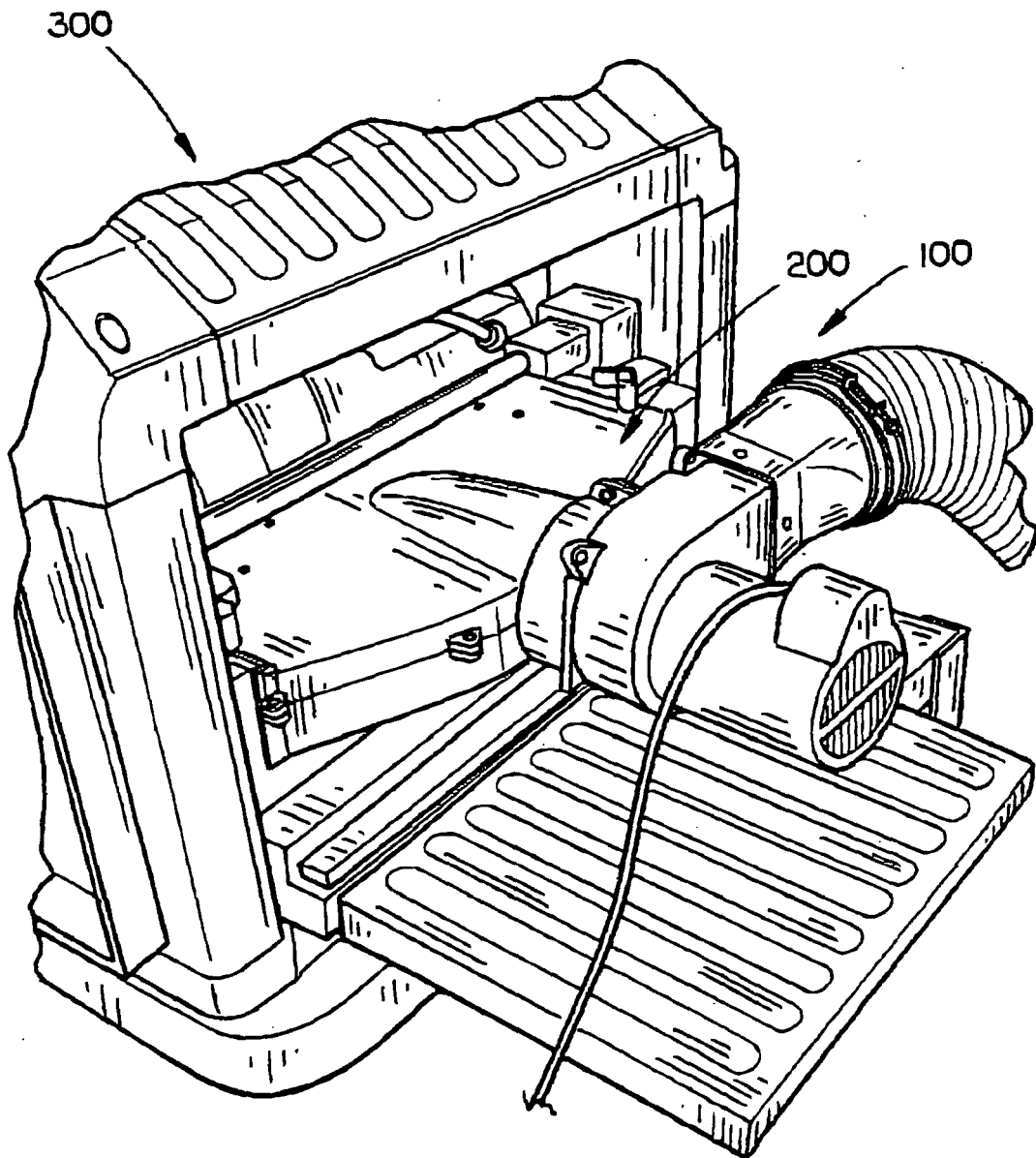


FIG. 2



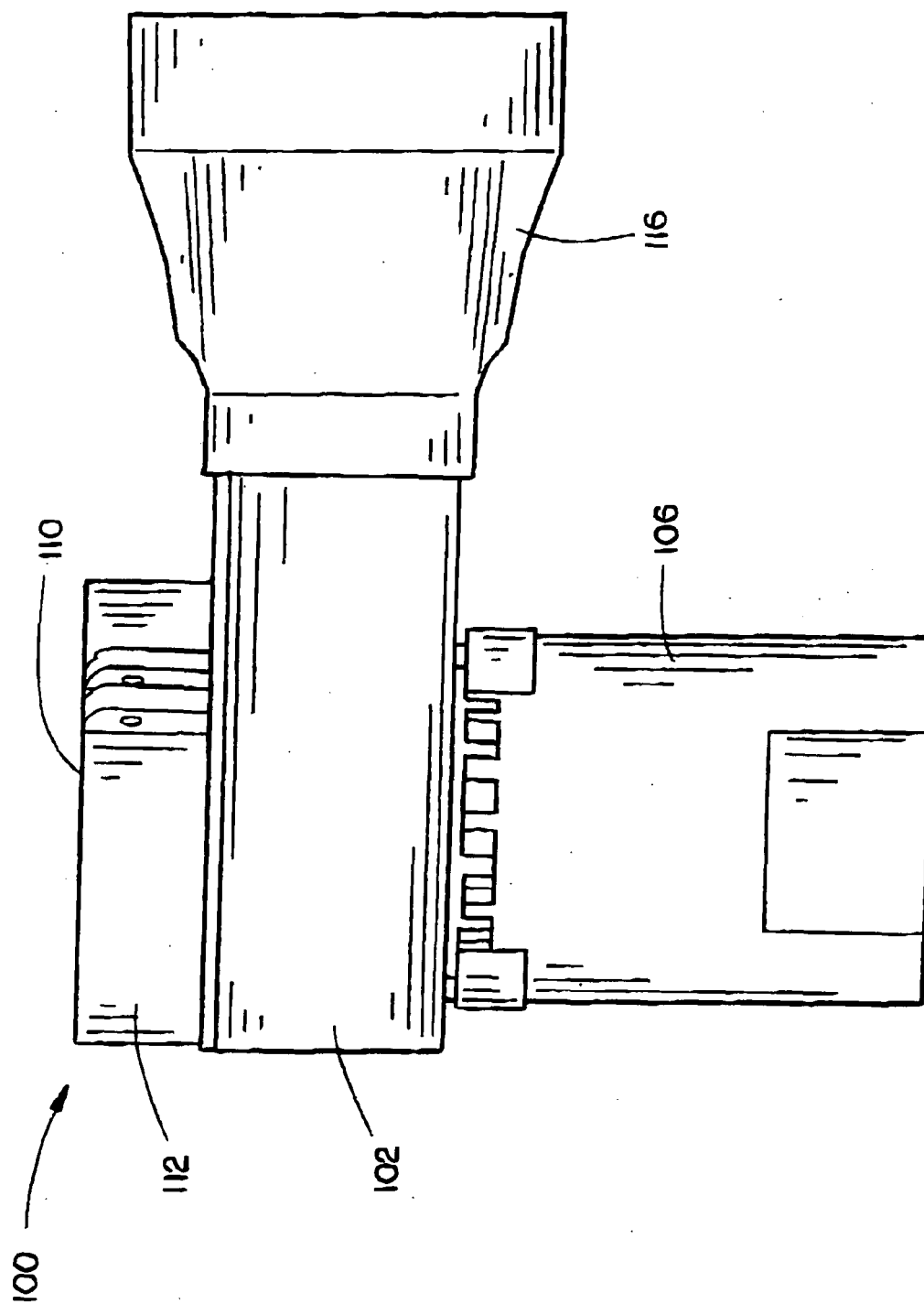


FIG. 3

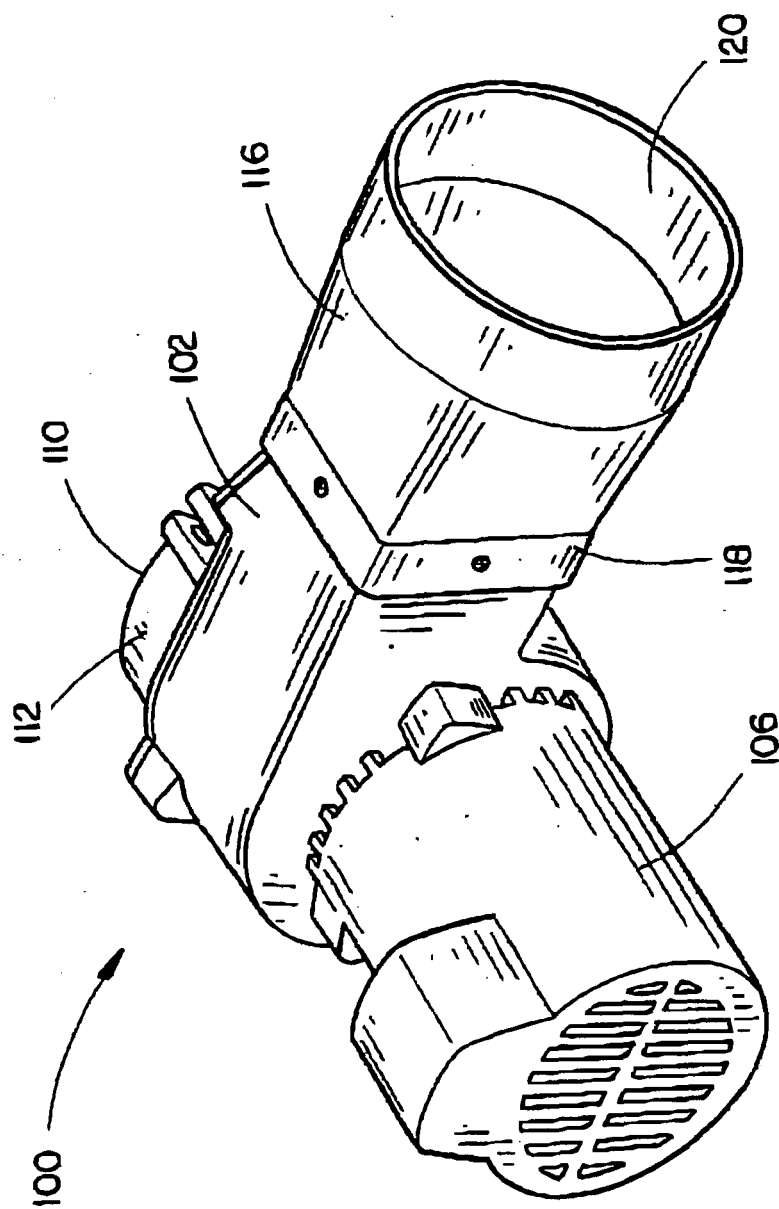


FIG. 4

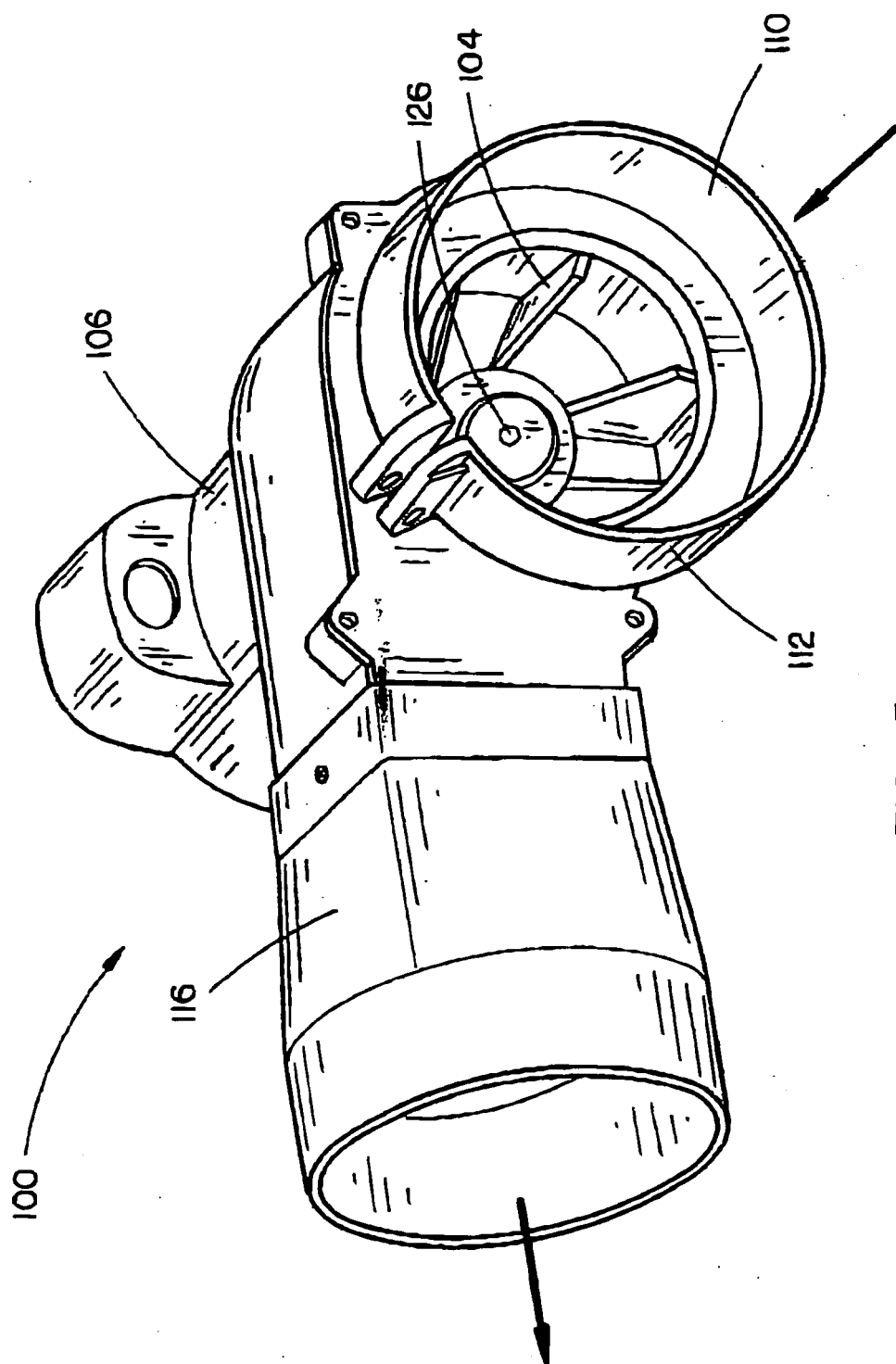


FIG. 5

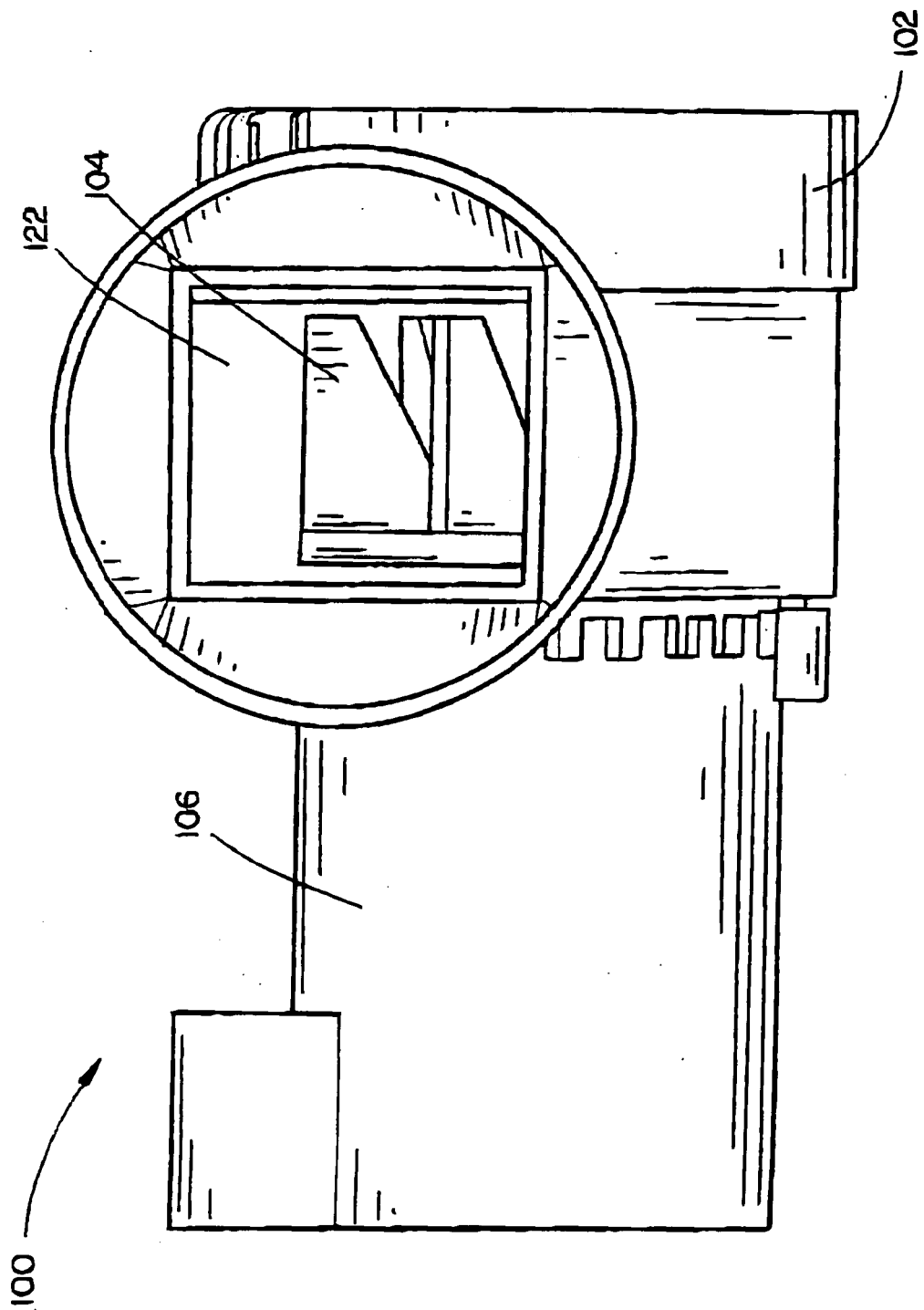


FIG. 6

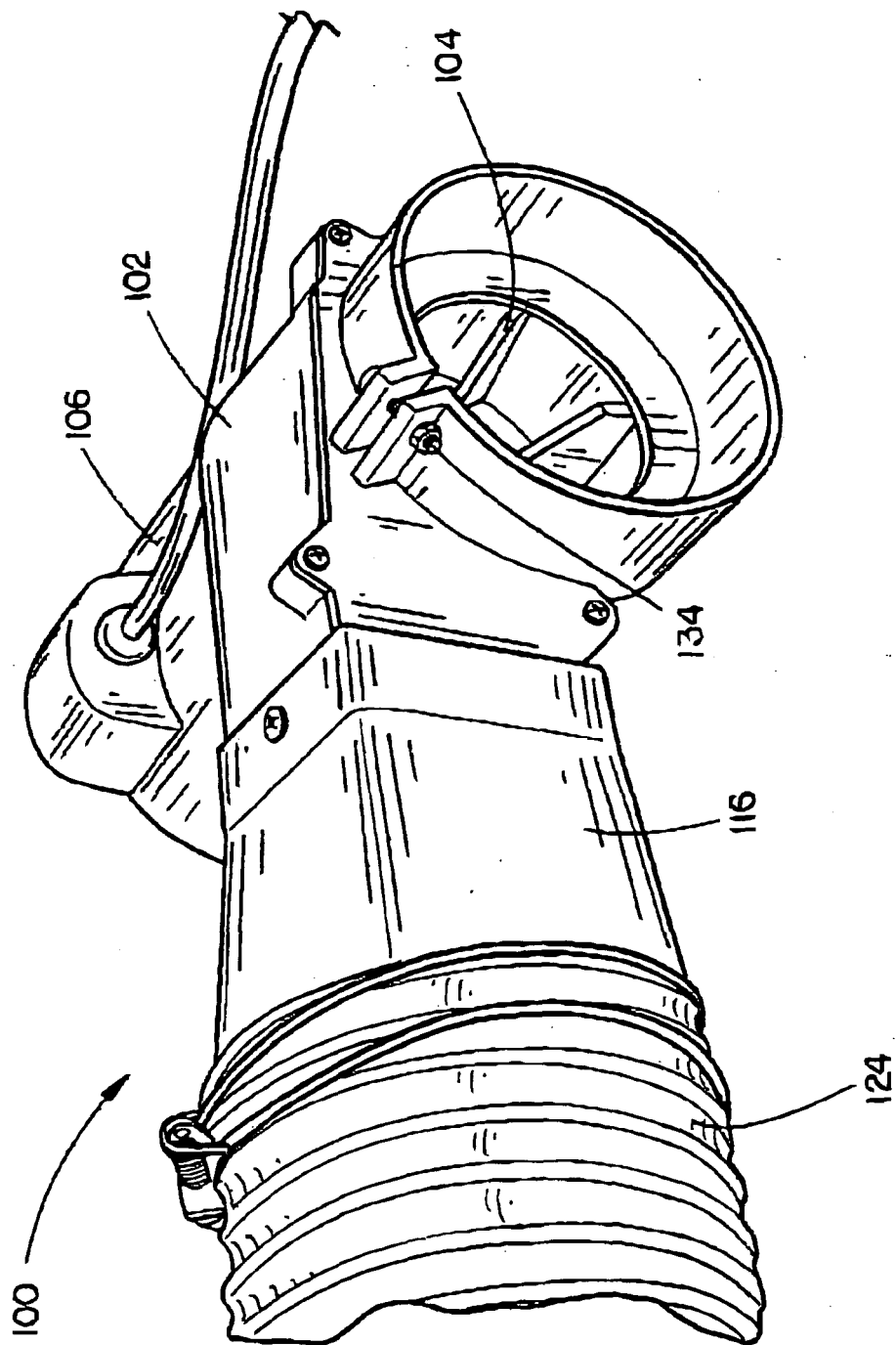


FIG. 7

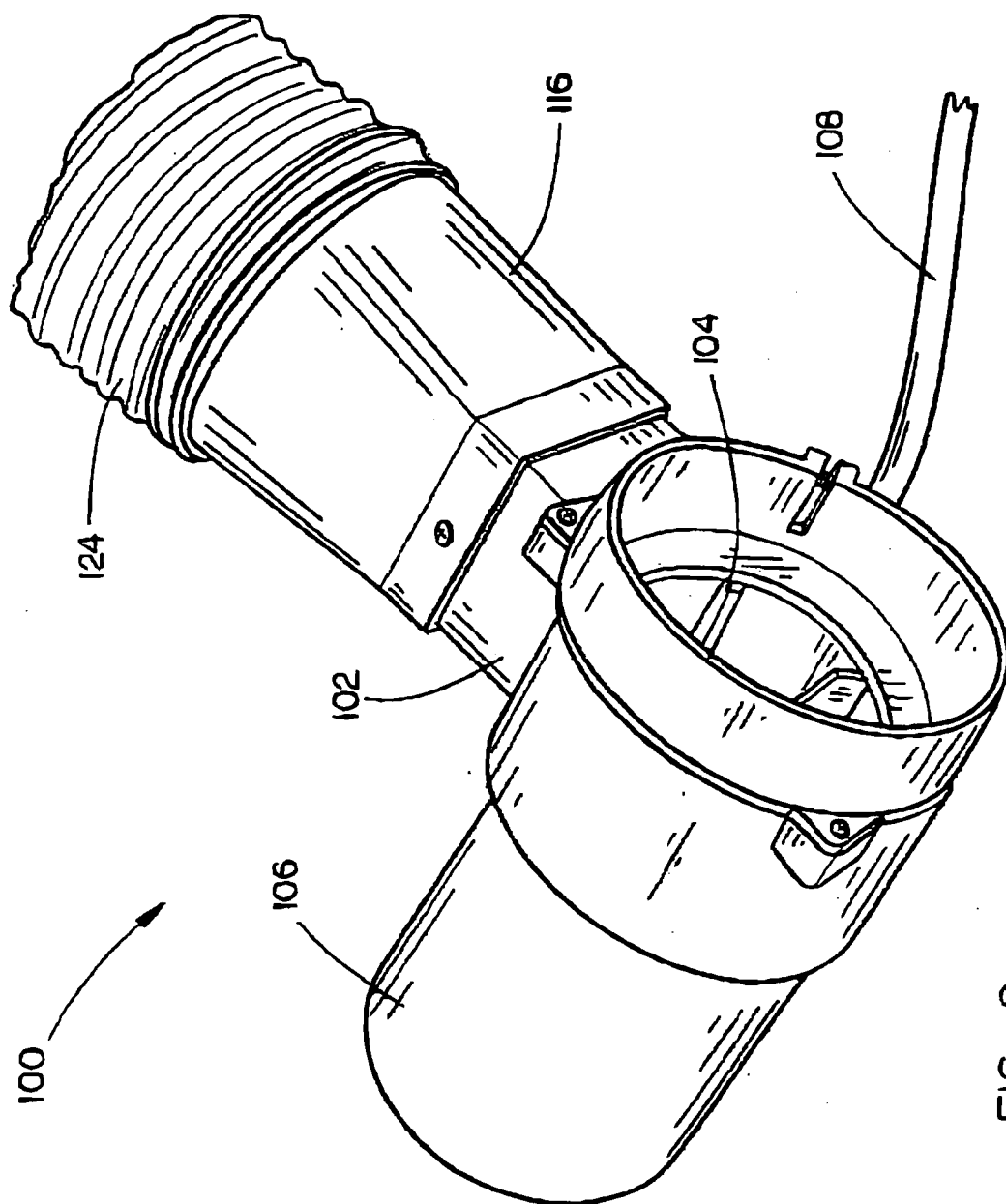


FIG. 8



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2003/220060 A1 (BURES STEVE ET AL) 27 November 2003 (2003-11-27) * paragraphs [0024] - [0041] *	1-3,5-12	B24B55/10 B24B23/00
Y	* figure 1 *	4	
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Y	* figure 1 *	4	
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			TECHNICAL FIELDS SEARCHED (IPC)
			B24B H05K
The present search report has been drawn up for all claims			
Place of search <b>Munich</b>		Date of completion of the search <b>28 November 2005</b>	Examiner <b>Koller, S</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 01 9855

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28-11-2005

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