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(54) WALL-MOUNTED RANGE HOOD

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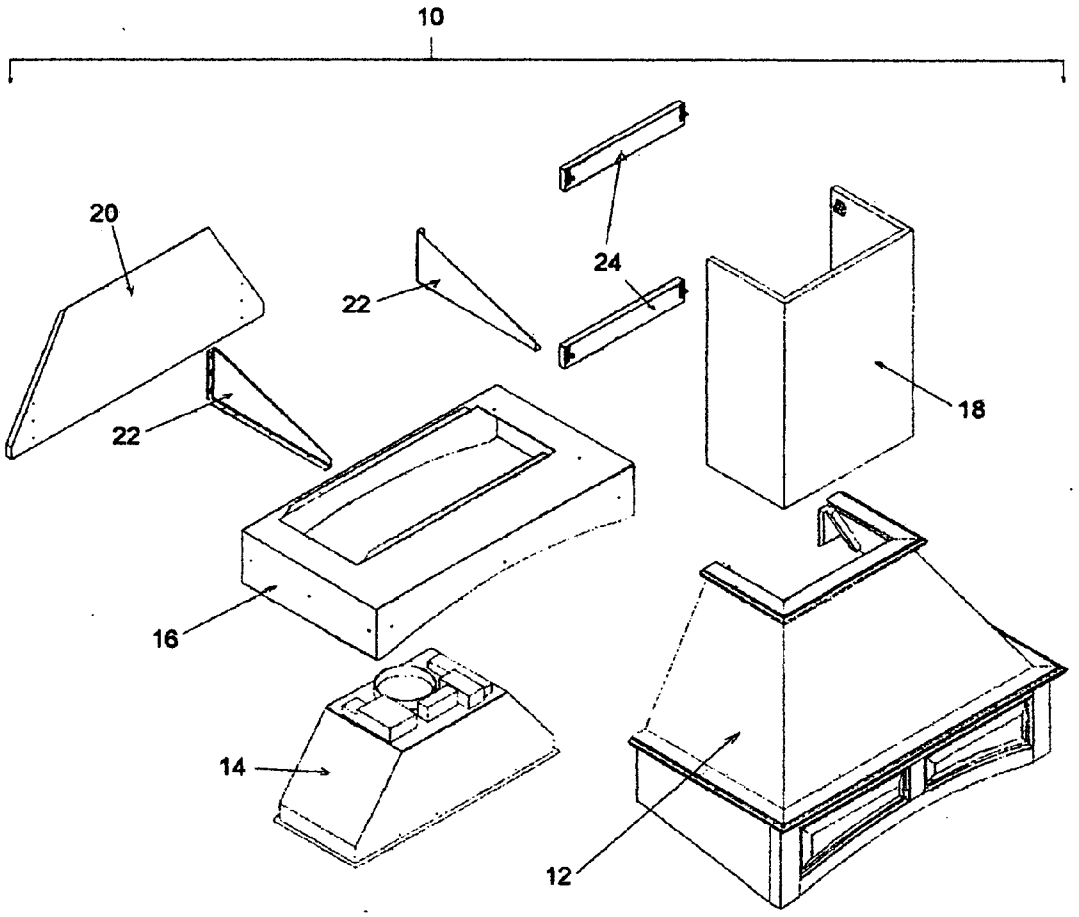
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(57) **ABSTRACT**

A wall-mounted range hood for the collection and exhausting of fumes includes a mounting board that is affixed to a wall adjacent to and above a select area (cooking area) and where an exhaust assembly fits onto the mounting board by engagement with supporting hardware located thereon, and where the shroud is also mountable onto the mounting board by engagement with reverse angles located in compatible orientation between the top of the mounting board and the top of the shroud.



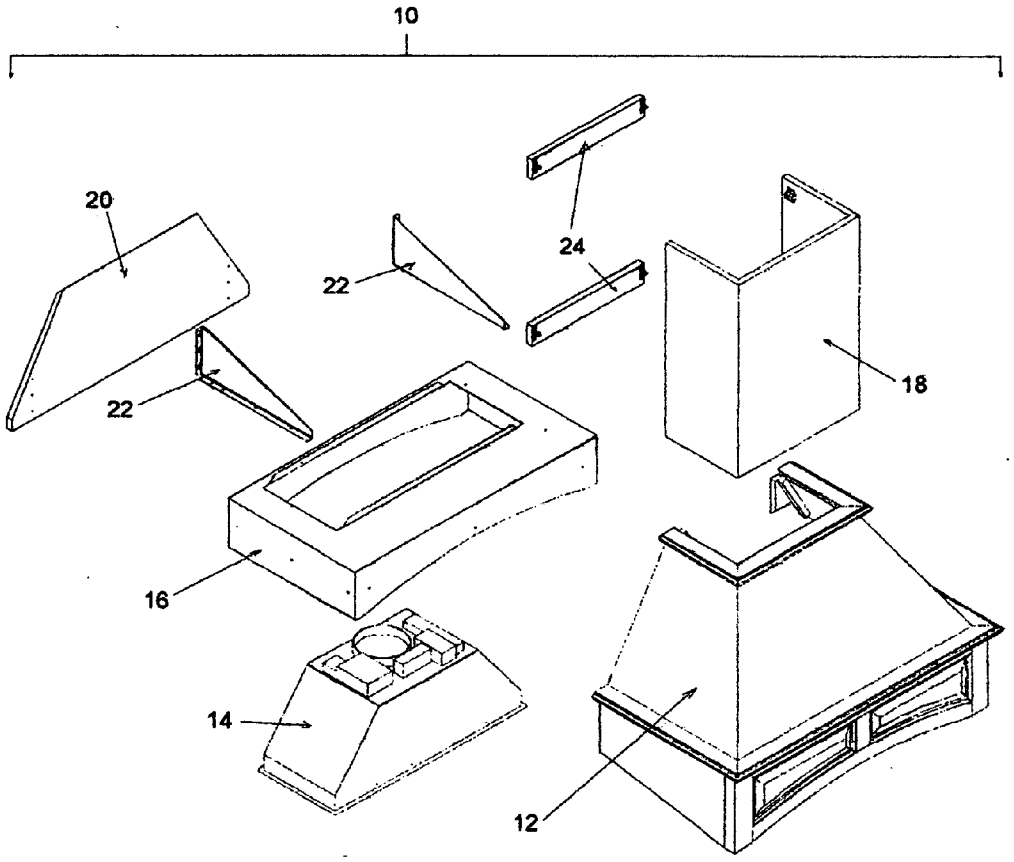


FIG. 1

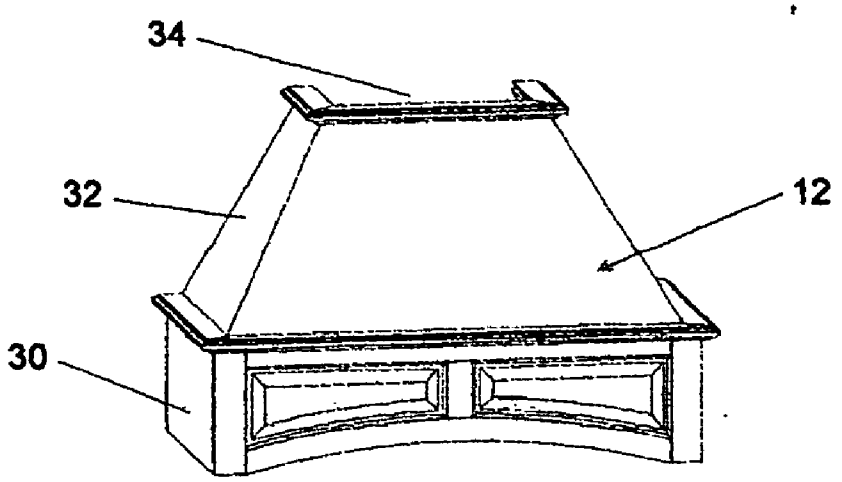


FIG. 2

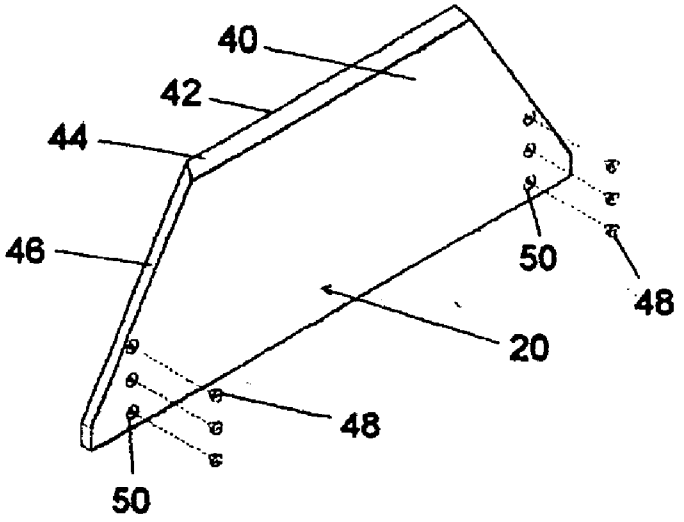


FIG. 3

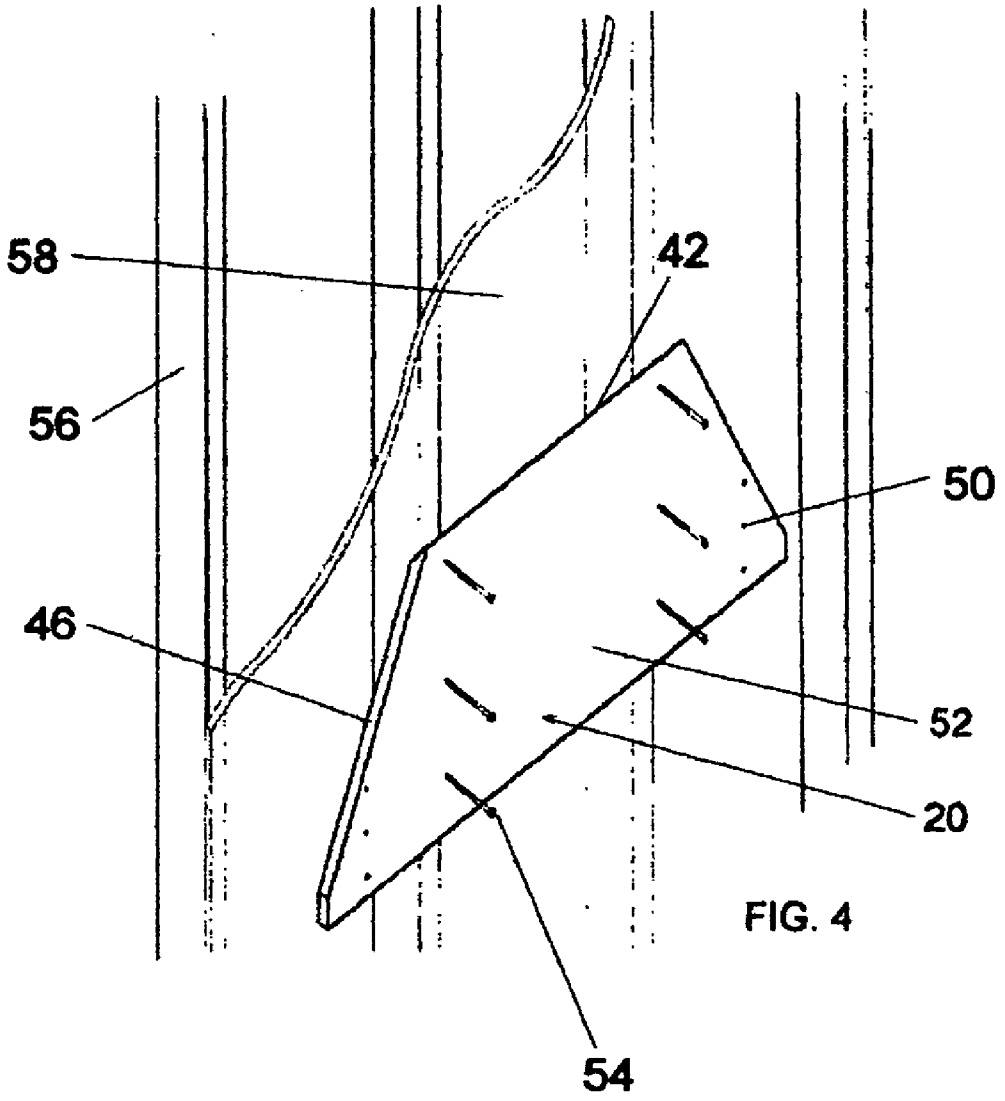


FIG. 4

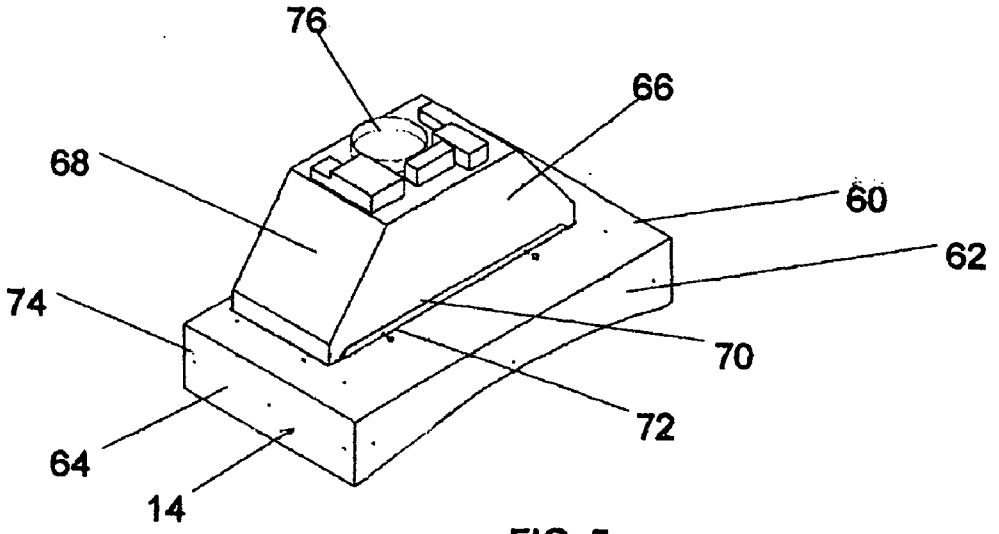


FIG. 5

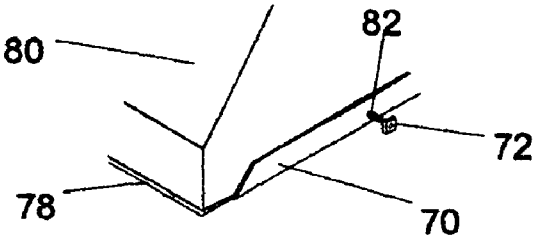


FIG. 6

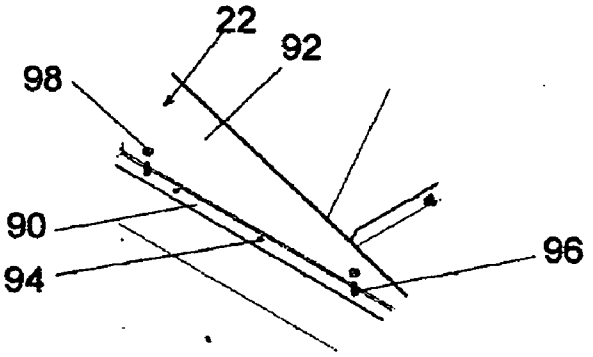


FIG. 8

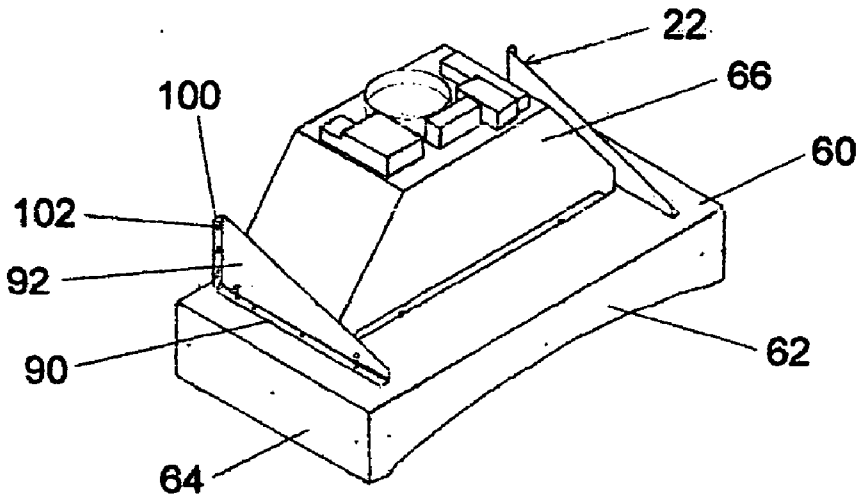


FIG. 7

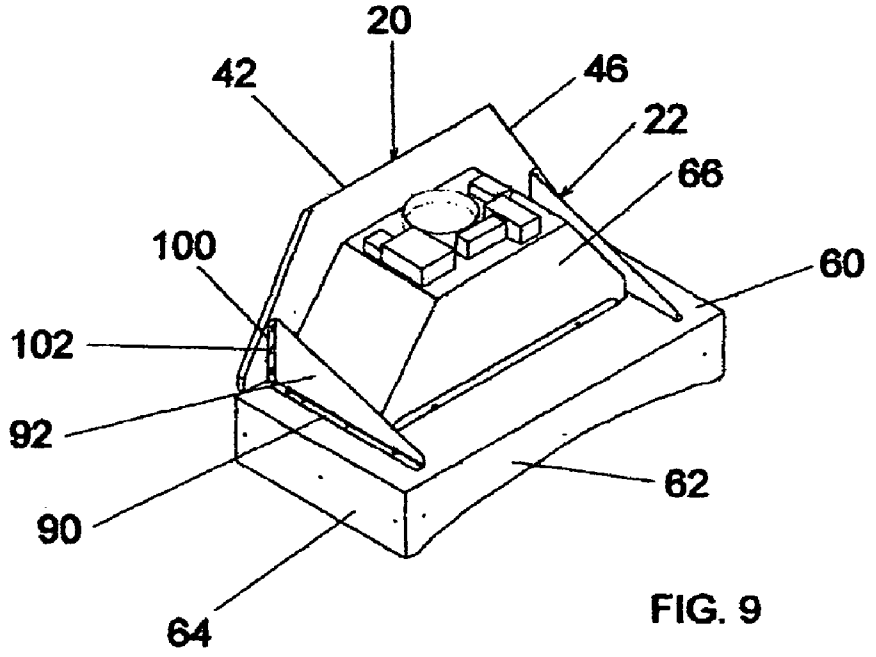


FIG. 9

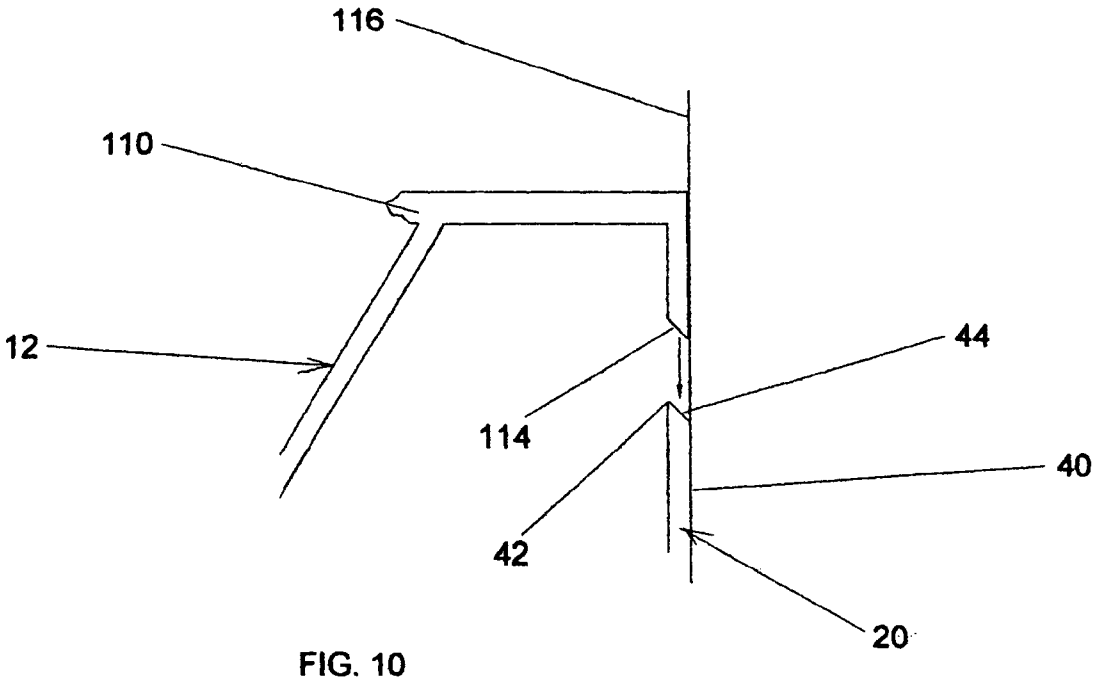


FIG. 10

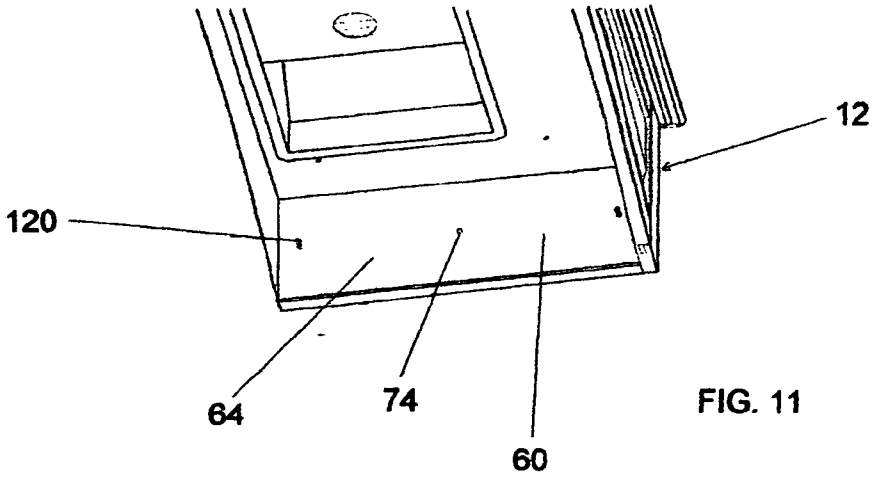


FIG. 11

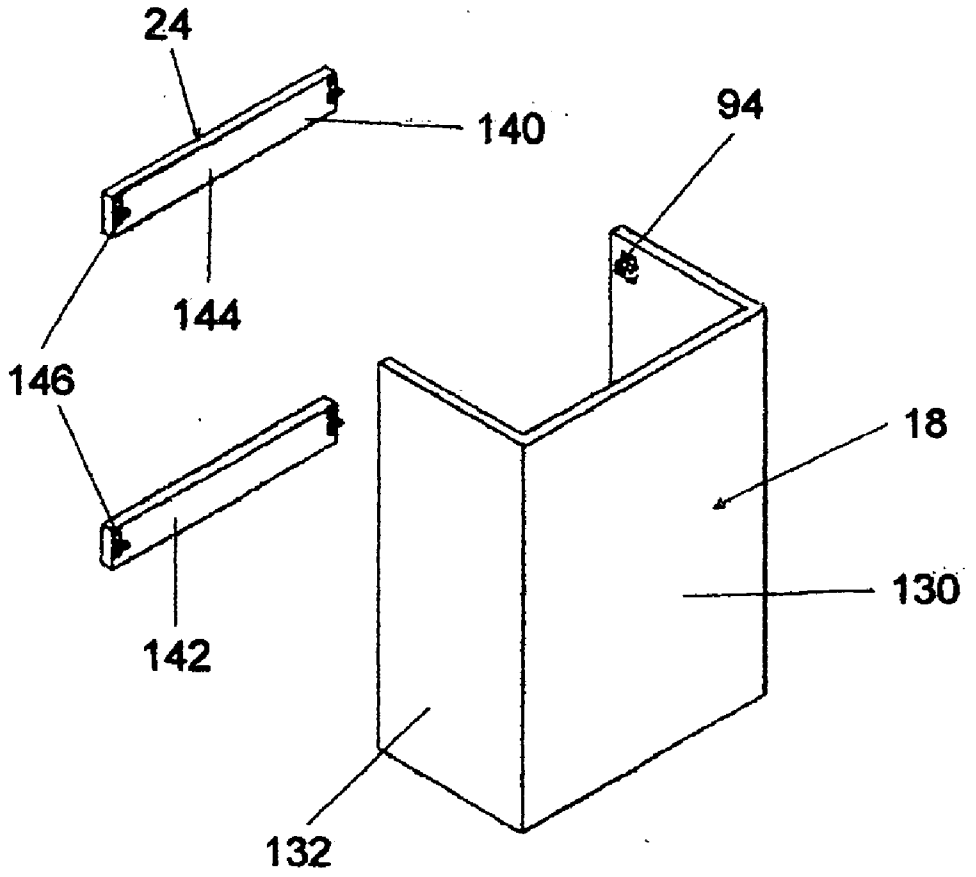


FIG. 12

WALL-MOUNTED RANGE HOOD

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] Not applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not applicable

BACKGROUND OF THE INVENTION

[0003] The present invention relates to range hoods for collecting fumes in a kitchen environment. Various types of fumes arise from the cooking process; some of which are merely the evaporation of water and water-soluble materials, while other fumes are noxious or even toxic. The origin of the cooking process no doubt arose during pre-historic times when hunting became a successful strategy for feeding early man. Once the "kill" was brought back to their encampment, someone eventually thought of placing it over the fire, thus resulting in the first efforts in the culinary arts.

[0004] Over time, the cooking process did not so much evolve, as did the method for creating a cooking place. Open campfires moved inside, where the hearth of a fireplace was not only used to heat the interior of a home or an inn, but it also offered a place for food to be prepared. At some point the carcass of the kill was replaced with more artful food preparations, which now required the use of hardware for placing the food into the cooking environment. Changes occurred in this environment too, with modifications for improving the access and use of the cooking area and with the introduction of crude ovens for baking other products. These wood fired applications necessitated the usage of chimneys to draft away the combustion products. Sufficient sizing of the combustion area was needed to ensure that the fire would burn properly and that it would be contained and not burn down the residence. Thus crude collection of the smoke and other gases developed without real regard to the cooking process itself

[0005] Obviously the days of wood fired cooking in the home have passed and electric and natural gas-fired cooking stations are the dominant installations found in modern homes. The need for exhausting huge volumes of air has also passed since electric and natural gas applications, by themselves, do not produce much in the way of toxic or noxious products. It is now the by-products of the cooking process itself that set the parameters for fume collection and exhaust. These by-products include gases that emanate from the food as it is cooked as well as particulates that are ejected from the cooking process, such as grease or oil droplets. The objectives of fume control are now more directed at the comfort level of the user and less concerned with safety and fire control issues.

[0006] The modern usage of fume control and collection in cooking applications extends across a range of applications. Home use is one area, however, the most comprehensive and sophisticated control and collection systems are in use in commercial applications such as restaurants or institutions like hospitals or long term care facilities. These systems have introduced a large number of features that are not needed in the home environment, such as fire suppression and draft controls, however, the basic hood construction is not necessarily all that different in many commercial applications than those found in home use. The prior art for hood construction for cooking surfaces includes systems that are based on a support frame that is mounted to a wall. In one such commercial use, the frame is anchored to the wall and is reinforced using vertical supports. The bulk of the hood itself is cantilevered over the cooking area reducing the need for vertical supports at the front of the system that would pose an obstruction to the user. The frame is then covered with compatible "skin" such as stainless steel sheet.

[0007] A very popular wooden range hood for home use is either purchased as part of or is compatible with factory made cabinet construction, or it is built on site. In either event, such units require a great deal of carpentry skills in order to successfully mount the range hood in place. For example, the internal exhaust components are hung within the space above the cooking surface. Typically, framework is supplied with the exhaust units that work within standard widths. Once installed, the assembly of these components remains exposed with the fume collector portion of the exhaust unit positioned appropriately and with the exhaust ducting and fan and motor located above. A compatible wood front is then fastened over the internal assembly, covering up the components and providing a cosmetic transition between adjacent cabinets. The wooden front is typically fastened in place by threading screws through an interior frame and into the adjacent cabinets.

[0008] Drawbacks in the conventional range hoods include the complexity of the installation of the units. Even when this occurs in new construction, the number of steps involved render it a time consuming event and the potential for errors in misalignment are great. At a later date, should the exhaust components need to be repaired, cleaned or replaced, then the ability to easily accomplish this task is frustrated again by the method of installation.

[0009] There are other range hoods that are offered for use in the residential kitchen. These units are typically fabricated from sheet metal and have a collector that spans the area of interest over the cook-top. The collector transitions into a duct that then runs through the ceiling and to an exhaust somewhere to the exterior. Unlike the range hoods with wooden fronts, these units are suspended from above the ceiling and do not represent the same type of considerations. For example, a metal hood system can be used over an island installation in the middle of the kitchen. No need exists for cosmetic transition between adjacent cabinets in situations such as this since there are no adjacent cabinets.

[0010] Lastly, a third type of range hood is provided for home applications, one that is basically an exhaust system that mounts directly underneath a cabinet. Some cabinet manufacturers supply a short cabinet for installation over a cook-top. This does provide some additional storage space, however it is difficult to use given the fact that access to the cabinet commences at a height greater than normal and the cooking surface itself may pose an obstruction to being able to conveniently use the cabinet. Notwithstanding, a so-called range hood is made for such installation but most that are provided are actually recirculation systems. The fan will pull a draft above the cooking area and then route it through an activated carbon pack before returning it in some fashion to the air in the kitchen. The advantage in these units is the low

profile they have and they do reduce some of the emissions involved in the cooking to a limited extent. Eventually, however, the carbon packs become saturated and/or fouled and really do not work as intended. The user is left to replace the carbon packs or to leave the unit operating as is.

[0011] Aside from the fact that the recirculating range hoods do not exhaust the fumes, they do represent a method for mounting a system in between the adjacent cabinets. The mounting method though is very much the same as explained for the conventional wood front units described above, requiring the screwing of side frames into the side-walls or frames of the adjacent cabinets. In some cases, these low profile range hood do provide for direct exhausting of fumes. In this event, the output from the fan is ducted upwards into the cabinet above through a duct that is routed out the top of the cabinet and towards an exterior exhaust. Installation of the basic components remains essentially the same.

[0012] It is an object of the present invention to overcome some of the difficulties in the installation of range hoods, in particular wood fronted range hoods. It is also a goal of the present invention to provide a range hood that can be quickly and easily hung in place with a minimum of critical potential errors for misalignment. Lastly, another one of the many benefits of the present invention is the ability to provide a sequence of instructions to a person who does not normally install cabinets, so that a real do-it-yourself option is created for those who wish to avoid the costs of hiring a contactor to take on the job.

[0013] These and many other benefits of the present invention will be disclosed in more detail below.

SUMMARY OF THE INVENTION

[0014] A new range hood in accordance with the present invention comprises a wall mount, an exhaust unit, and a shroud, where the wall mount is mounted to a wall above a cooking area at a height appropriate for mounting a range hood. The exhaust unit is mountable to the wall mount and the shroud is then positionable onto the wall mount in a way to cover the wall mount and the exhaust unit, the wall mount holding the shroud in place until it can be securely fastened.

[0015] A chimney may be supplied with the range hood of the present invention, where the chimney extends between the top of the shroud and the ceiling immediately above the cooking area.

[0016] The range hood of the present invention is also prepared as a kit whereby the wall mount, the exhaust unit, and the shroud are provided along with instructions for mounting the range hood, the steps comprising:

[0017] mounting the wall mount to a wall above a cooking area at a height appropriate for mounting a range hood;

[0018] preparing a liner and blower assembly;

[0019] fastening at least two mounting brackets to the liner and blower assembly at predetermined locations;

[0020] aligning the mounting brackets affixed to the liner and blower assembly to predetermined locations on the wall mount;

[0021] connecting the mounting brackets to the wall mount;

[0022] positioning the shroud onto the wall mount, supporting the top of the shroud therefrom;

[0023] aligning the shroud while suspended from the wall mount so as to cover and enclose the liner and blower assembly; and,

[0024] fastening the liner and blower assembly to the shroud.

[0025] The method of the present invention also includes the steps necessary to mount a chimney section between the top of the shroud and the ceiling above a cooking area.

[0026] The range hood of the present invention also includes other variations and features that allow it to be easily installed and to minimize errors in the installation process. These variations and features will be disclosed in more detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] **FIG. 1** shows an exploded isometric view of the range hood of the present invention with a chimney.

[0028] **FIG. 2** shows a perspective view of a shroud for a range hood of the present invention.

[0029] **FIG. 3** shows a perspective view of the backside of a mounting board for a range hood of the present invention.

[0030] **FIG. 4** shows the mounting board of **FIG. 3** being mounted onto a stud wall construction.

[0031] **FIG. 5** shows a perspective view of a liner and blower assembly for a range hood of the present invention.

[0032] **FIG. 6** shows a portion of the perspective view of **FIG. 5** disclosing an example where the liner and blower meet and are fastened together.

[0033] **FIG. 7** shows a portion of the perspective view of **FIG. 5** disclosing an example where the mounting bracket and the liner meet and are fastened together.

[0034] **FIG. 8** shows a perspective view of a liner and blower assembly for a range hood of the present invention where the mounting brackets are installed onto the top of the liner.

[0035] **FIG. 9** shows the liner and blower assembly of **FIG. 8** with the mounting brackets being mounted onto the mounting board.

[0036] **FIG. 10** shows a side cross-sectional view of a top portion of the shroud and the top portion of the mounting board as mounted onto a wall, indicating by arrow how the shroud is supported on the top of the mounting board.

[0037] **FIG. 11** shows a portion of the underside of an installed range hood of the present invention disclosing how the liner is fastened to the inside of the shroud.

[0038] **FIG. 12** shows an exploded isometric view of a chimney assembly for a range hood of the present invention, disclosing the chimney mounting boards in locations for mounting the chimney thereon.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0039] A new range hood in accordance with the present invention exhibits an improved set of components that can be assembled easily and efficiently, and then easily and efficiently installed in a location above a cooking surface. The range hood of the present invention may be supplied as part of a cabinet system to be installed by a contractor homebuilder, or, the range hood may be offered as a kit for installation by a do-it-yourself handyman type of person.

[0040] Turning to **FIG. 1**, a wall mounted range hood **10** is generally comprised of a shroud **12**, a blower **14**, a liner **16** and a mounting board **20**. In some installations, it may be that general assembly is sufficient to complete an installation, however, if the top of the shroud does not meet the ceiling, then the usage of a chimney **18** and associated chimney mounting boards **24**, may be used to transition between the shroud and the ceiling. For the purposes of describing the invention herein, it will be understood that the chimney may or may not be required depending on the sizing of the range hood components and the circumstances of an individual installation.

[0041] The components of the range hood shown in **FIG. 1** are shown in an exploded orientation relative to their position in the total assembly. Individually, the shroud **12** is seen in **FIG. 2** and includes the collector portion **30**, the transition portion **32** and the chimney opening **34**. The shroud is shown in a wood treatment that matches a molding style that is selected to be consistent with the cabinet and molding treatments used in the overall kitchen installation.

[0042] In **FIG. 3**, a mounting board **20** includes a mounting board back **40** (the mounting board in this view is shown from the backside), a board top **42**, a board top angle **44**, mounting board sides **46**, and with T-nuts **48** which are inserted into associated through holes **50**. The T-nuts are exemplary of the type of hardware that may be used in this instance; what is required is some hardware that is competent to support the exhaust assembly of the present invention, as will be seen below. It is noted that the mounting board is constructed of wood in the preferred embodiment, however it could also be fabricated from other materials, including but not limited to, plastic or steel.

[0043] **FIG. 4** shows a mounting board **20** positioned for installation onto a stud wall. The stud wall is comprised of the studs **56** and is covered by the wallboard **58**. In this view, the mounting board front **52** can be seen along with the wood screws **54** that are aligned for installation into the mounting board and into the studs. Also shown are the though holes **50** which will retain the hardware (T-nuts) that will be used for the installation of the mounting brackets **22** onto the mounting board. The wood screws securely fasten the mounting board to the wall if they tap into the studs. This consideration is a fairly common installation technique for do-it-yourself applications that rely on the strength of the screw fastened to the stud to ensure the integrity of the finished project. While it is not shown in the view, the mounting board is typically located at a desired location above a cooking surface. Many times the cooking surface is a range that includes a number of burners, either gas or electric, and also an oven. The height of cooking surfaces usually is maintained close to three feet from the floor, although this will vary for each installation and for each type of cooking surface employed. A range hood will typically commence at about two feet above the cooking surface although it can certainly be higher than this with adjustments made for exhaust velocity and volumes. The height of a range hood may then extend for another three feet or so and meet the ceiling (dependent also on the existence or lack of bulkheads) or as indicated above the range hood may terminate before it meets the ceiling in which case a chimney can be used to transition the gap in between.

[0044] **FIGS. 5, 6, 7, 8** and **9**, show the blower and liner assembly with the mounting brackets installed and in **FIG. 9**, as installed on the mounting board. In particular, the blower **14** includes the blower collector **60**, the blower front **62**, the blower side(s) **64**, the blower housing **66**, the blower transition **68**, and the blower collector flange **70**. The blower collector flange also shows the nuts **72** disposed at points along its length. Along the blower side(s) there are the pre-drilled holes **74**. Lastly, the blower duct **76** is shown exited the top of the blower housing **66**.

[0045] In **FIG. 6**, a closer view of the fit between the blower and the liner is seen, where the blower housing **66** sits within the blower collector opening **78** and is secured with stud **82** that is threaded through the collector flange hole(s) **71** with the head of the stud to the inside of the blower housing and with the threaded end of the stud exposed to the exterior and capped with a nut **72**. Also, the blower collector holes **73** are shown as being disposed on the blower collector and as will be seen below, these will line up with the holes in the mounting brackets.

[0046] In **FIG. 7**, the mounting bracket **22** is shown being connected to the top of the blower collector through pre-drilled mounting bracket holes **94**. In this case, stud(s) **96** are threaded through the pre-drilled holes with the threaded ends exposed to the exterior of the blower collector. The studs are secured by nut(s) **98** which affixes the mounting bracket(s) to the blower collector. Also shown is the mounting bracket flange **90** which contains the mounting bracket holes, and the mounting bracket body **92**.

[0047] The assembly in **FIG. 8** reveals the combination of the blower being connected to the liner as well as the mounting brackets being connected to the liner. The mounting brackets are further shown with the mounting flange **100** and the keyholes **102**. **FIG. 9** takes the assembly one step further with the inclusion of the mounting board **20** where the mounting brackets are lined up such that the keyholes are aligned with the through holes of the mounting board.

[0048] The fit between the shroud **12** and the mounting board **20** is shown in **FIG. 10** where the shroud and mounting board are both shown in cross section. The shroud includes the shroud top **110**, the shroud backplate **112**, and the shroud backplate angle **114**. The mounting board is shown as being mounted to the wall **116**. When the shroud is positioned onto the mounting, this occurs by having the shroud backplate angle engage the corresponding top angle **44** on the mounting board. This conveniently supports the shroud while its alignment with the blower and liner assembly is adjusted.

[0049] The underside of the range hood of the present invention can be seen in **FIG. 11**, with the shroud **12**, the blower collector **60** and blower side(s) **64**. The pre-drilled holes **74** can be seen also in close proximity to the interior

sides of the shroud collector. The collector screws **120** are then inserted into the pre-drilled holes that fastens the blower and liner assembly to the shroud.

[**0050**] Lastly, **FIG. 12** shows the chimney portion of the range hood. Specifically, the chimney **18** includes the chimney front **130**, the chimney sides **132**, and the chimney bracket **134**. Associated with the chimney are the mounting boards **24** which include the upper mounting board **140**, the lower mounting board **142**, the board face **144**, and where each mounting board has a pair of board brackets **146**. The chimney brackets do align with the spaced board brackets and when the two meet, they become engaged and retain the chimney in the desired position. While it is not shown, there are a pair of chimney brackets near the top of the chimney and a pair located near the bottom of the chimney section.

[**0051**] As can now be appreciated, the range hood of the present invention allows for efficient and easy installation. Once the location of the cooking surface has been established, assuming this is not an island or peninsula, the components of the range hood can be staged for mounting. The height of the range hood is selected and the mounting board is mounted to the wall at the corresponding point. The mounting board, as mentioned above, is preferably secured to studs within the wall so as to ensure that the installation will adequately handle the weight of the assembly.

[**0052**] The liner and blower are brought together by inserting the blower into the collector opening and securing it with fasteners. Additionally, the mounting brackets are then placed in position on the liner and the holes on both the mounting brackets and the liner are aligned, then the mounting bracket is fastened.

[**0053**] The assembled blower and liner can be set aside while screws (T-nuts) are inserted into the through holes on the mounting board. These screws will typically have heads that will compatibly insert into and engage the keyholes in the mounting brackets. Thus when they are engaged into the mounting board, they can be left partially undone with enough clearance to allow the blower and liner assembly, with the mounting brackets thereon, to be initially mounted onto the mounting board. The holes and alignment of components are all pre-arranged so that no adjustments should be needed at this point, just tightening of the fasteners.

[**0054**] Continuing the installation process, the shroud is positioned to engage the mounting board top which with the complementary angles between the shroud backplate and the mounting board top will allow the shroud to be supported. This again, simplifies the handling of the components so that the shroud and the liner can be fastened.

[**0055**] The consideration remains whether or not to use a chimney. The top of the shroud has an opening in which the chimney can be inserted, however, the chimney is alignable with previously installed chimney mounting boards (upper and lower) so that the corresponding brackets will be in proximity and can be engaged when the chimney is pressed into place. The chimney length can be adjusted to fit each individual application by merely just trimming one end. As alluded to above, the chimney might not be required in some application where a bulkhead exists or where the ceiling height and the height of the shroud do not require any extension (chimney) to transition in between.

[**0056**] The installation of the range hood is essentially complete although there has been no discussion about the electrical and venting requirements. These functions remain the same as conventional range hoods and it is understood that the connections and fitting of each is to be done at the time the blower and liner assembly is in place and prior to the installation of the shroud.

[**0057**] The range hood of the present invention preferably uses a wood shroud since that is the main cosmetic selection of purchasers. It is not necessary to practice the preferred embodiment with a wooden shroud since a metal shroud would also work equally well. In addition, a combination of wood and metal treatment for the shroud may also be considered without departing from the spirit and teachings herein.

[**0058**] The range hood may be packaged as a kit for use by do-it-yourself home improvement aficionados. The easier and user friendly installation method allows this option to be explored since the need to have fairly significant carpenter skills and/or equipment is minimized to a process that now can be completed in many instances, with nothing more than a tape measure, a drill and a screwdriver.

[**0059**] The teachings of the present invention are not meant to be restrictive, but are intended to illustrate the variations on the scope of the embodiments discussed herein.

1. A wall-mounted fume hood for collecting and exhausting fumes over a select area comprising:

A mounting board for mounting to a wall above and adjacent to a select area to be exhausted at a height and location appropriate for the collection of flumes;

An exhaust portion;

A shroud portion covering the mounting board and the exhaust portion; and,

Where the exhaust portion and the shroud portion are supported by said mounting board.

2. A wall-mounted fume hood according to claim Number **1**, where it further includes a chimney portion.

3. A wall-mounted flume hood according to claim Number **2**, where said chimney is sized for installation between the top of said fume hood and the ceiling above the select area.

4. A wall-mounted flume hood according to claim Number **1**, where said shroud portion is mountable onto said mounting board by reversible engagement with reverse angles between said shroud portion and said mounting board.

5. A wall-mounted fume hood according to claim Number **1**, where the exhaust portion is reversibly mounted onto said mounting board by engagement with supporting hardware installed in aligned fashion on said mounting board.

6. A wall-mounted fume hood according to claim Number **5**, where the exhaust portion further includes at least a pair of mounting brackets for engagement with said supporting hardware.

7. A wall-mounted fume hood according to claim Number **1**, where the shroud portion and the exhaust portion are reversibly installable onto the mounting board.

8. A wall-mounted fume hood for collecting and exhausting fumes over a select area comprising:

A mounting board for mounting to a wall adjacent to and above a select area and at a height appropriate for the operation of the fume hood;

An exhaust portion mountable onto a mounting board affixed to said wall;

A shroud portion for covering said mounting board and said exhaust portion and where said shroud portion is mountable onto said mounting board; and

Where ach of said exhaust portion and said shroud portion are reversibly installable onto said mounting board.

9. A wall-mounted fume hood according to claim Number **8**, where it further includes a chimney sized for installation between the top of said fume hood and the ceiling above a select area.

10. A method for installing a wall-mounted fume hood above a select area, the steps of which comprise:

Determining the desired location for said fume hood to a wall;

Affixing a mounting board to the wall in accordance with the desired location of the fume hood;

Providing supporting hardware at designated locations on the mounting board;

Assembling an exhaust portion for said fume hood;

Mounting said exhaust portion assembly onto the mounting board by engagement with said supporting hardware;

Fastening said exhaust portion assembly to the mounting board;

Connecting all exhaust and electrical fittings and/or supplies;

Mounting a shroud portion onto said mounting board thereby covering the mounting board and the exhaust portion assembly; and,

Fastening said exhaust portion assembly to said shroud portion.

11. A method for installing a wall-mounted fume hood according to claim Number **10**, further including the steps:

Obtaining a sized chimney portion compatible with installation to the wall;

Mounting said chimney portion between the top of the flume hood and the ceiling above the select area.

12. A method for installing a wall-mounted fume hood according to claim Number **10**, where the exhaust portion assembly further includes mounting brackets for engagement with said supporting hardware.

* * * * *