The present invention is directed to a sheet material support device that may be mounted on a framing component, such as a stud. The sheet material support device provides one or more mounting surfaces to which sheet material may be attached. In some embodiments, the sheet material support device may be configured to grip the stud.
FIGURE 5
This invention is directed to construction materials, and more particularly one or more embodiments are directed to sheet material support devices.

BACKGROUND OF THE INVENTION

In the construction industry, a common material for finishing walls, floors and ceilings is sheet material. Sheet material may include drywall, plywood, wall board, paneling or other appropriate materials. By far the most common material for finishing interior walls and ceilings is drywall. Drywall, like other sheet materials, is typically fastened directly to framing components, such as studs and/or joists, that are assembled to form the skeleton of a building, such as a dwelling or commercial building. In general, studs or joists are typically made of framing grade lumber dimensioned as 2"x4", 2"x6", or 2"x8" pieces and the drywall is hung by screwing or nailing the sheet directly into the studs or joists.

FIGS. 1A and 1B illustrate the use of studs and joists for hanging sheet material in the prior art. FIG. 1A is a schematic illustration of an intersection of building components in accordance with the prior art. In particular, the intersection 33 illustrates the placement of studs as wall A intersects with wall B and wall C. In this arrangement, at least three studs 20a, 20b, and 20c are utilized to establish mounting surfaces for each wall surface. Stud 20a serves as a mounting surface for wall A, stud 20b serves as a mounting surface for wall B, and stud 20c serves as a mounting surface for wall C. In the construction industry, the spacing between studs may be set by building codes or laws. For instance, in many applications the spacing between studs is typically about 16 inches between centers of two adjacent studs. Thus, if the last stud before an intersection is positioned so that it has adjacent studs within this required amount, then one or more of the mounting surface studs 20a, 20b, and 20c may not need for structural support. However, the mounting surface studs 20a, 20b, and 20c are still needed to provide support to mount an end of a sheet material thereto.

FIG. 1B illustrates a device 10 that may be used to support sheet material in accordance with the prior art. The device 10 may be secured to a back surface of a stud 20a at an intersection or corner rather than using a stud as mounting surface as is described in FIG. 1A. That is, the device 10 may be used as a mounting surface for sheet material rather than stud 20c in FIG. 1A. Upon being secured to a back surface of the stud 20a, a front surface 10a of the device 10 is within the plane of wall C. Thus, sheet material that may be secured to the studs 20 to form wall C are also secured to the front surface 10a of device 10. In some situations, the device may be difficult to install or unable to be installed because the device 10 is secured to a back surface of the stud 20a. For instance, in some cases studs 20 adjacent stud 20a may be so close that their position prevents a builder from being able to secure a device 10 to a back surface of stud 20a. Furthermore, moment arm forces being applied to the surface 10a of the device 10 by the installation of the sheet material may cause the device 10 to detach or break away from the back surface of the stud 20a.

FIG. 1B is a schematic illustration of an intersection of building components in accordance with the prior art. FIG. 2A is an isometric view of a sheet material support device in accordance with one embodiment of the invention. FIG. 2B is a cross sectional view of the sheet material support device shown in FIG. 2A. FIG. 3 is a schematic illustration of the sheet material support device of FIGS. 2A and 2B on a stud in accordance with one embodiment of the invention. FIG. 4 is a schematic illustration of the sheet material support device of FIGS. 2A and 2B at an intersection of building components in accordance with one embodiment of the invention. FIG. 5 is a schematic illustration of a sheet material support device in accordance with one embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Embodiments of the present invention are directed toward helmets, and more particularly one or more embodiments are directed to helmets comprising surface reinforcing components. Some embodiments relate to helmets comprising one or more surface reinforcing components with anchoring features embedded in a structural feature of the helmet such as a force absorbing element. Certain details are set forth below to provide a sufficient understanding of the invention. However, it will be clear to one skilled in the art that the invention may be practiced without these particular details.

The present invention is directed to a sheet material support device that may be mounted on a framing component, such as a stud. The sheet material support device provides one or more mounting surfaces to which sheet material, such as drywall, plywood, wall board, paneling and any other appropriate material, may be attached. In some embodiments, the sheet material support device may be configured to grip the stud.

FIG. 2A is an isometric view of a sheet material support device 100 in accordance with one embodiment of the invention. FIG. 2B is a cross sectional view of the sheet material support device shown in FIG. 2A. The sheet material support device 100 may include a stud mounting component 102 and fastening receiving members 104. The fastening receiving members 104 includes an upper surface 105. The upper surface 105 of the fastening receiving members 104 may be configured to receive a sheet material mounted and secured thereto. The stud mounting component 102 may include a front mounting surface 106 and side mounting surfaces 108. The stud mounting component 102 may be configured to be mounted on a stud (not shown) such that an inner surface 110 of the front mounting surface 106 abuts a first surface of the stud. Each of the fastening receiving members 104 may be configured to extend in a plane of a wall when installed on a corresponding stud so that each of the fastening receiving members 104 may receive a sheet material mounted and secured thereto.

The sheet material support device 100 may optionally include backing members 112. The backing members 112 may be configured to abut a second surface of the stud. In some embodiments, the backing members 112 may assist in maintaining a position of the sheet material support device relative to the stud.
In one embodiment, the angle between the front mounting surface 106 and each side mounting surfaces 108 are orthogonal. In other embodiments, the angle between the front mounting surface 106 and each side mounting surfaces 108 forms an acute angle. For instance, in one embodiment the angle between the front mounting surface 106 and the side mounting surfaces 108 is less than 90° but more than 65°. In another embodiment, the angle is between 87° and 89° and in one embodiment, the angle is 88°. In some embodiments, the acute angle may assist in holding the sheet material support device 100 in place when positioned around a stud. For instance, in some embodiments, the angle may assist in holding the sheet material support device 100 in position without the use of fasteners, such as screws or nails.

In some embodiments, the sheet material support device may be secured to the stud with a fastener. In these embodiments, the front mounting surface 106 may include one or more grooves 116. The one or more grooves may extend the entire length of the sheet material support device 100 or less than the length of the sheet material support device 100. In some embodiments, the one or more grooves may assist in allowing the fastener, such as a screw, nail, staple, etc., to enter into the front mounting surface 106 with reduced slippage.

In the embodiment shown in FIGS. 2A and 2B the upper surface 105 of the fastening receiving members 106 is corrugated. The corrugated upper surface 105 of the fastening receiving members 104 may assist in preventing slippage while securing a sheet material thereto. In other embodiments, the upper surface 105 of the fastening receiving members 104 may be smooth or dimpled.

Some of the dimensions of the sheet material support device 100 may vary depending on the size of stud to which it may be secured. For instance, the width of the front mounting surface 106 and the side mounting surfaces 108 may be of sufficient size to fit around a particular size stud. In accordance to the above description, the stud mounting component 102 may be of sufficient size to clamp to on the stud and be held in position on the stud without the use of fasteners. The length of the sheet material support device 100 may vary. In some embodiments, the sheet material support device 100 has a length about the same as the length of a stud to which it will be attached. In other embodiments, the length of the sheet material support device 100 is any length less than the length of the stud to which it will be attached. In one embodiment, the sheet material support device 100 has a length that is a multiple of a foot plus an extra 1-4 inches at each end. For instance, in one embodiment, the total length of the sheet material support device is about 27 inches or in another embodiment, 51 inches.

The sheet material support device 100 may be made from any material capable of receiving fasteners and withstanding forces from securing the sheet material the fastening receiving members 104. In some embodiments, the sheet material support device 100 comprises a plastic material, such as polyvinyl chloride, polystyrene, polypropylene, high density polyethylene, acrylic, styrofoam or composites of the same. In some embodiments, the sheet material support device 100 is formed from a single piece of plastic. For instance, the sheet material support device 100 may be a single molded device. In other embodiments, the sheet material support device 100 may comprise materials, such as fiberglass, carbon fiber, tin, aluminum, steel, brass, or other sufficient materials.

FIG. 3 is a schematic illustration of the sheet material support device 100 of FIGS. 2A and 2B installed on a stud 130 in accordance with one embodiment of the invention. The inner surface 110 of the front mounting surface 106 abuts an upper surface 132 of the stud 130. The side mounting surfaces 108 abut side surfaces 134 of the stud 130. The backing members 112 (if included) may abut a back surface 136 of the stud 130.

In one embodiment, the sheet material support device 100 may be installed on a stud by separating the side mounting surfaces 108 from each other and the backing members 112 (if included) a sufficient amount to clear the stud 130. In some embodiment, the front mounting surface 106 may flex as the side mounting surfaces 108 are separated. The sheet material support device 100 may then be positioned to surround the stud 130 as shown in FIG. 3. Once the backing members 112 are positioned beyond the side surfaces 134 of the stud 130, the side mounting surfaces 108 may be released. In some examples, the acute angles between the front mounting surface 106 and the side mounting surfaces 108 allow the sheet material support device 100 to grip the stud. Thus, the sheet material support device 100 may be held in position on the stud without the use of fasteners.

In some embodiments, fasteners (not shown) may be used to secure the sheet material support device 100 to the stud 130. For instance, fasteners, such as screws, nails, staples, adhesive, or any other fastening device, may be used to couple the front mounting surface 106 to the upper surface 132 of the stud 130. In some embodiments, the fasteners are provided through the grooves 116 in the front mounting surface 106 and in to the stud 130.

FIG. 4 is a schematic illustration of the sheet material support device 100 of FIGS. 2A and 2B at an intersection 160 of building components in accordance with one embodiment of the invention. In particular, the building components of FIG. 4 comprise a plurality of studs 200 and joists 300. The intersection 160 is formed by the studs 200 and joists 300 that form wall A meeting with the studs 200 and joists 300 that form wall B and wall C. Stud 200a is the last stud in wall A before the intersection 160, stud 200b is the last stud in wall B before the intersection 160, and stud 200c is the last stud in wall C before the intersection 160. Studs 200b and 200c may be located a distance less than the requisite spacing to stud 200a. Thus, a subsequent stud for wall C and a subsequent stud for wall B are not needed. Instead, the sheet material support device 100 may be installed onto stud 200a as described in reference to FIG. 3. That is, the sheet material support device 100 may be installed on a front surface 232 of the stud 200a. In some embodiments, by being able to install the sheet material support device 100 on a front surface 232 of the stud 200a, a builder may have ease of access during the installation process. For instance, during installation a builder may only need to fit a single hand between stud 200a and the next adjacent stud 200 in the plane of wall A.

As is illustrated in FIG. 4, once the sheet material support device 100 is installed on to the stud 200a, the upper surface 105 of each respective fastener receiving member 104c and 104d may extend in a plane of respective walls, C and B. Thus, respective fastener receiving members 104c and 104d may be positioned to receive a sheet material (not shown) to form a respective wall A and wall B. That is, a sheet material (not shown) may be positioned on a surface of the stud 200a and the upper surface 105 of the fastener receiving member 104c to form wall C, and a sheet material (not shown)
may be positioned on a surface of the stud 200b and the upper surface 105 of the fastener receiving member 104b to form wall B. Fasteners (not shown) may be used to secure a respective sheet material to the fastener receiving members 104b and 104c. In some embodiments, a cross base 400 may be further added to provide further stability for the sheet material.

In some embodiments, the sheet material support device 100 may be separated into two separate parts for applications that do not need the addition of both fastener receiving members 104b and 104c. For instance, if in FIG. 4 the stud 200b was located close to stud 200b so that the side mounting surface 104b of the sheet material support device 100 was not needed, the left side of the sheet material support device 100 may be separated from the right side. In particular, the front mounting surface 106 may be bent along one of the grooves 116. In one embodiment, to separate the left and right sides, the front mounting surface 106 may be repeatedly bent in a first direction and in an opposite direction until the left and right sides separate.

FIG. 5 is a schematic illustration of a sheet material support device 500 in accordance with one embodiment of the invention. The sheet material support device 500 is similar to the sheet material support device 100 of FIG. 1, however, the sheet material support device 500 includes a segmented stud mounting component 103. Although four segments are illustrated in FIG. 5, the segmented stud mounting component 103 may include any number of segments. The spacing between the segments may be any amount that is sufficient to provide structural support to the fastening receiving members 104. A surface 105 of each of the fastening receiving members 104 may be corrugated, dimpled, flat, or any suitable surface.

Although the present invention has been described with reference to the disclosed embodiments, persons skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention. Such modifications are well within the skill of those ordinarily skilled in the art. Accordingly, the invention is not limited except as by the appended claims.

What is claimed is:

1. A sheet material support device to be secured to a stud and configured to support a plurality of sheet materials, the sheet material support device comprising:
   a front mounting surface;
   a plurality of side mounting surfaces, each of the plurality of side mounting surfaces extending from a respective side of the front mounting surface, the front mounting surface in combination with the plurality of side mounting surfaces being configured to be secured to the stud; and
   a plurality of fastening receiving members, each of the fastening receiving members extending outwardly from a respective side mounting surface and configured to at least partially support a respective one of the plurality of sheet materials.

2. The sheet material support device of claim 1 wherein each of the plurality of side mounting surfaces extend from a respective side of the front mounting surface at an acute angle.

3. The sheet material support device of claim 2 wherein the angle is between approximately 87° and 89°.

4. The sheet material support device of claim 1 wherein an surface of each of the fastening receiving members is corrugated.

5. The sheet material support device of claim 1 further comprising backing members coupled to an end of the fastening receiving members and configured to abut a surface of the stud.

6. The sheet material support device of claim 1 wherein the front mounting surface includes at least one longitudinal groove extending along a surface thereof.

7. The sheet material support device of claim 1 wherein the front mounting surface, the plurality of side mounting surfaces, and the plurality of fastening receiving members are molded as a single plastic piece.

8. The sheet material support device of claim 1 wherein each of the fastening receiving members extend from a respective side mounting surface in a plane substantially parallel with the front mounting surface.

9. An assembly comprising:
   a framing component;
   a sheet material support device secured to the framing component, the sheet material support device including a front mounting surface, a plurality of side mounting surfaces, and a plurality of fastening receiving members, each of the plurality of side mounting surfaces extending outwardly from a respective side of the front mounting surface, each of the fastening receiving members extending from a respective side mounting surface; and a respective sheet material secured to each of the fastening receiving members.

10. The assembly of claim 9 wherein each of the plurality of side mounting surfaces extend from a respective side of the front mounting surface at an acute angle.

11. The assembly of claim 9 wherein the angle is between approximately 85° and 89°.

12. The assembly of claim 9 further comprising backing members coupled to an end of the fastening receiving members and configured to abut a surface of the framing component.

13. The assembly of claim 9 wherein the sheet material support device is secured to the framing component with at least one fastener device.

14. The assembly of claim 13 wherein the front mounting surface includes at least one groove to receive the at least one fastener device.

15. The assembly of claim 9 wherein framing component is a stud.

16. The assembly of claim 9 wherein each of the fastening receiving members extend in a plane parallel to a surface of the framing component.

17. A method of providing a surface for installing sheet material using a sheet material support device, the sheet material support device including a front mounting surface, a first and second side mounting surface, and a plurality of fastening receiving members, each of the plurality of side mounting surfaces extending outwardly from a respective side of the front mounting surface, each of the fastening receiving members extending from a respective side mounting surface, the method comprising:
   separating a portion of the first side surface from a portion of the second side surface;
   placing the sheet material support device around a framing component;
   releasing the first and side mounting surfaces to allow the first and second side mounting surfaces to abut a respective surface of the framing component;
securing the front mounting surface to the framing component; and
securing a sheet material to one of the side mounting surfaces.

18. The method of claim 17 wherein securing the front mounting surface to the framing component comprises securing the front mounting surface to the framing component with a screw, a nail, or a stapler.

19. The method of claim 17 wherein releasing the first and side mounting surfaces causes the sheet material support device to grip the framing component.

20. The method of claim 17 wherein each of the plurality of side mounting surfaces extend from a respective side of the front mounting surface at an acute angle.

* * * * *