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Bodycomb et al.

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[54] **EASILY DISMANTLED PARTITION STRUCTURE**

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[52] **U.S. Cl.** **52/483,** 24/DIG. 18, 52/346

[51] **Int. Cl.** **E04b 2/82**

[58] **Field of Search** 52/483, 480, 479, 346; 24/DIG. 18, 203

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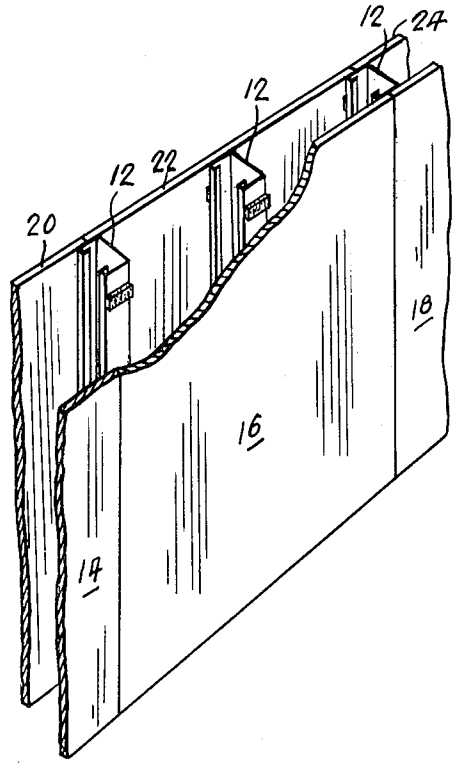
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[57] **ABSTRACT**

A partition structure incorporating fastener elements of the hook and loop type that permit dismantling of the partition by removing the panels in the direction substantially perpendicular to their faces. Also disclosed is a fastener strip roll to facilitate application of fasteners in the field.

4 Claims, 9 Drawing Figures



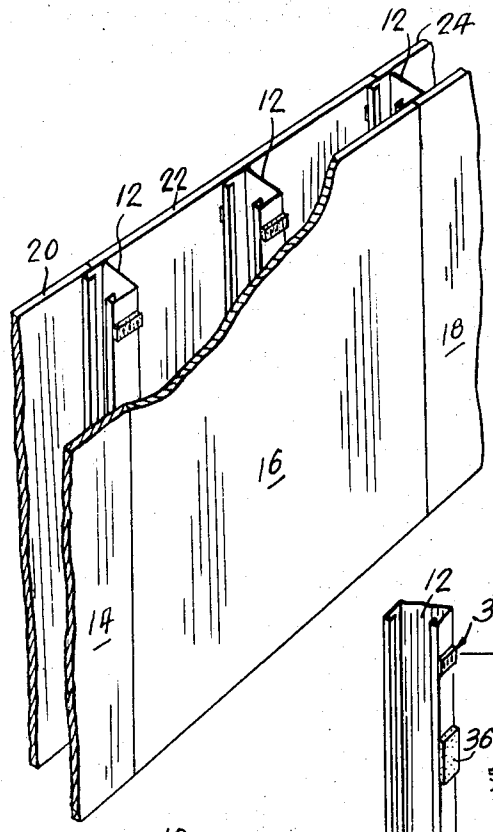


FIG. 1

FIG. 2

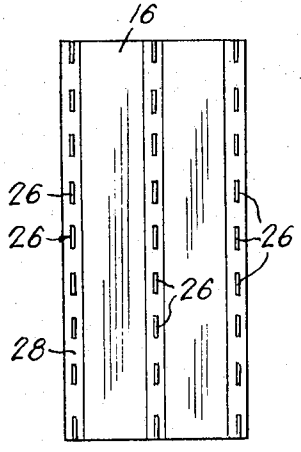


FIG. 3

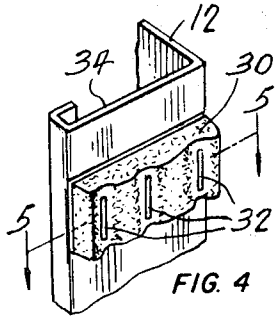


FIG. 4

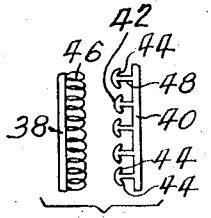


FIG. 6

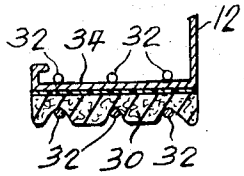


FIG. 5

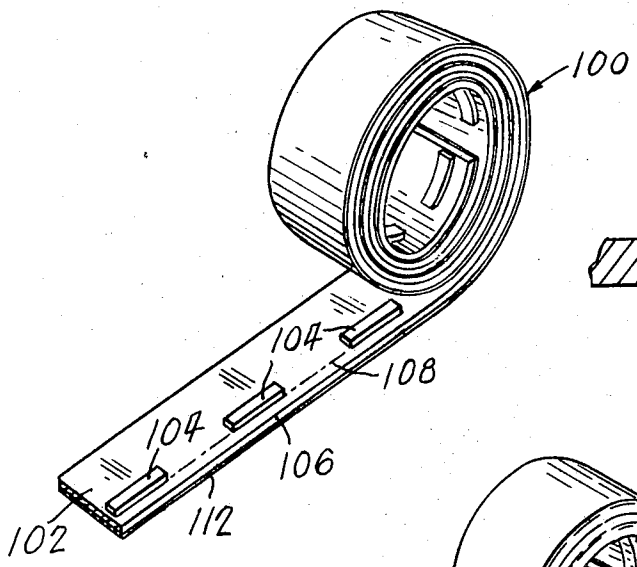


FIG. 7

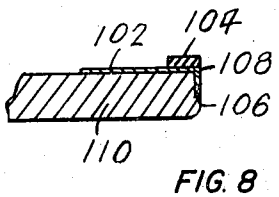


FIG. 8

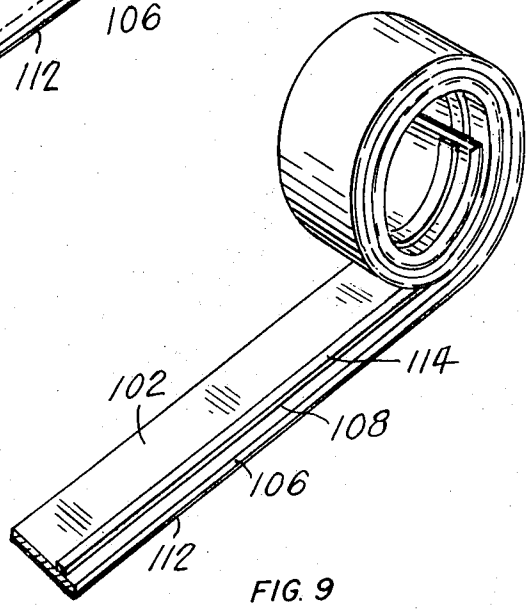


FIG. 9

EASILY DISMANTLED PARTITION STRUCTURE

FIELD OF THE INVENTION

The present invention relates to a partitioning system, more specifically to a panel structure incorporating loop and hook elements to hold the panels to the studding, and to a method of erecting such a structure.

DESCRIPTION OF THE PRIOR ART

Various types of partitions, in particular easily dismantleable partitions for office buildings, have been proposed and many have found commercial application. Some such commercial systems currently being installed are dismountable but only with difficulty. Also many different techniques for mounting panels on studs have been proposed in the literature including the patent literature. However, none of these arrangements provide a commercially satisfactory structure wherein the panels may be peeled off in a direction substantially perpendicular to their face and removed directly from the studding. The majority of the partition arrangements proposed use batten strips to cover the joints between adjacent panels and to hide the mounting mechanisms securing the panels to the studs. Systems have been proposed wherein the batten strips are completely eliminated but such arrangements normally require either gluing the panels directly to the stud, which of course inherently makes dismantling difficult, or clipping the panel to the stud which requires complicated mechanical gadgetry.

It is the object of the present invention to provide a simple system for securing the panels to the stud which system facilitates both erection and dismantling of the partition wall.

It is quite common to secure the fastening elements to the panels in the field. This allows more leeway to determine the number of fasteners used, etc., and permits more leeway in the positioning or number of studs used. This is particularly important where panels must be cut, for example in corners and the fastening elements must be provided to cooperate with the stud at the end of the wall.

It is thus a further object of the present invention to provide a fastener strip easily connectible to the rear face of a panel.

SUMMARY OF THE INVENTION

Broadly, the present invention relates to a partition comprising studs, a plurality of discrete fastening members secured at spaced points along said studs, a panel, a plurality of mating connecting elements secured to said panel in spaced relationship for cooperating with said fastening members. One of said fastening members or said connecting elements being in the form of a plurality of loops and the other of said fastening members or said connecting elements being in the form of a plurality of hooks adapted to cooperate and lock in said loops.

The present invention also relates to a fastener strip comprising a flexible backing sheet, fastener elements secured to said backing sheet, said fastener elements being narrower than said backing sheet and being spaced a fixed distance from one edge of said sheet. Preferably the fastener strip will be supplied as a roll and the backing sheet will be of paper having a fold line spaced from said edge substantially the same distance as said fasteners.

BRIEF DESCRIPTION OF THE DRAWING

Further features, objects and advantages will be evident from the following detailed description of a preferred embodiment of the present invention taken in conjunction with the accompanying drawings in which:

FIG. **1** is an isometric view with parts omitted showing one type of wall structure incorporating the present invention;

FIG. **2** is a partial isometric view illustrating a stud with mounting means connected thereto at spaced points;

FIG. **3** is a plan view of the back of a panel to be mounted on the stud of FIG. **2**;

FIG. **4** is a partial but enlarged isometric view of the stud of FIG. **2** illustrating the preferred method of securing the fastening members to the stud;

FIG. **5** is a view along the line **5—5** of FIG. **4**;

FIG. **6** is a side elevation of the looped member and preferred hook member for fastening the panels on the studs;

FIG. **7** is an isometric view of a fastener strip roll for application to the panels;

FIG. **8** is a partial sectional view through an edge of a panel having the fastener strip of FIG. **7** secured thereto; and

FIG. **9** is a view of a roll similar to FIG. **7** but illustrating a continuous fastener strip applied to the backing sheet.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Generally, a wall incorporating the present invention is constructed in the conventional manner with the exception that the panels are held on the wall by a type of fastening member novel in the field of wall structures. As illustrated in FIG. **1**, the wall basically comprises a plurality of substantially vertical studs **12** which in the illustrated arrangement has panels **14, 16** and **18** on one side and panels **20, 22** and **24** on the opposite side, to form two exposed wall surfaces. In the arrangement illustrated the panels are in abutting relationship and no batten strips are provided, however, if desired batten strips could be used to cover the joints or the joints could be formed in other more esthetic ways, for example, by spacing the panels slightly to provide a vertical space extending between pairs adjacent panels such as **14** and **16.**

The panels **14, 16, 18, 20, 22** and **24** are secured to the studs **12** by suitable hook and loop fastening elements such as those sold under the trade mark "VELCRO". One of the fastening elements is secured to the stud **12** while the cooperating fastening element is secured to the panel as shown in FIG. **2** and **3.** These fastening elements may be secured at spaced locations to the stud as indicated at **30** and to the back of the panel as indicated at **26.** The spacing between these elements **30** has been indicated as *X* and will generally be about 4 inches to about 3 feet preferably about 8 inches to 2 feet. Alternatively, one or both the elements **30** or **26** may extend as a continuous strip for substantially the length of the overlap between the stud and panel. In any event care must be taken to ensure that the proper amount of cooperating Velcro strips are used so that the panel is supported, yet may be dismantled without undue difficulty.

The fastening elements **26** may be secured to the panel, say panel **16** as illustrated in FIG. **3** by adhesive, however, special care must be taken when gypsum board panels are used. When gypsum panels are to be mounted, strips such as strips of kraft paper as indicated at **28** extending vertically on the panel **16** are secured thereto by a suitable adhesive. The fastening means **26** are secured to the kraft paper **28** and a satisfactory bond is obtained between the elements **26** and the panel. It has been found that the paper strip **28** should extend substantially the full height of the panel and should be at least approximately 4 inches wide. Wider strips obviously could be used but this would be simply adding extra material.

Difficulty may be encountered in securing the fastening elements **30** of FIG. **2** to the studs **12** when steel studs are used, as adhesive will not properly bond these materials unless relatively expensive adhesives are used or specific steps are taken to clean the stud before application. It has been found, however, that by stapling the fastening elements **30** directly to the stud by means of suitable staples **32** as shown in FIGS. **4** and **5** adequate bonding of the fastening elements **30** can be obtained. In the illustrated arrangement **3** staples, one at each opposite end of the element and the third in the centre of the element are used, however two staples, one at each end may also be used depending on the weight of the panel to be supported.

It is important that the panel be mounted on the stud in a manner to permit little if any relative movement between the panel and stud when the panel is in position. All Velcro fasteners are not sufficiently rigid to stop this relative movement and thus are not commercially satisfactory for mounting panels as they permit the panels to shift too easily thus requiring means be provided to prevent this shifting.

Resilient means may be interposed between the stud and the panel in the area between the cooperating connecting elements to bias the panel away from the stud and thus apply tension on the hook and loop members to thereby limit the amount of relative shifting that can occur. One such system is to provide resilient members or pads **36** secured to the stud **12** and bearing against the inside of the panel **16** (see FIG. **2**). Preferably, these members **36** are not connected to the panel **16.** The pads **36** preferably are a foam material having resilience to the direction perpendicular to its face, i.e., perpendicular to the flange **34** but having only very limited movement in a direction parallel to the flange **34.**

In the preferred embodiment a conventional loop member **38** of the Velcro type is made of, for example, nylon and cooperates with a T-shaped hook member of formed plastic material as indicated at **40.** It will be noted that the T-shaped hooks **42** are relatively rigid and are each undercut on opposite sides as indicated at **44** to lock with the loops **46** of the loop member **38.** The height of the stem **48** of the T-members **42** should be short and the loop length **46** should be short so that the panel **16** and stud **12** are close together. The shorter stems and loops can be made, the less opportunity for relative movement. It has been found that when using such an arrangement, resilient pads such as those illustrated at **36** may be omitted.

One suitable system incorporating Velcro loop 2000, stapled to the studs **12** at 12-inch spacings and cooperating with Velcro MVA-5 one-half-inch wide hook strips either continuous or discontinuous (6 inches long at 12 inch spacing is very satisfactory) has been built and found to be quite satisfactory even without resilient pads **36.**

The fastener strip may be secured to the back of the panel in a variety of different ways. It is contemplated that the backing strip and fasteners may be pre-applied at the factory or alternatively may be applied in the field. The fasteners and backing strip may be applied as a unit or the paper strip may be first applied followed by the fastener strip being applied to the paper in situ. In the latter case, paper itself may be applied by the factory and the fastener strips applied to the paper in the field. Preferably the fastener strip will be supplied separately and will include both the fastener and the backing sheets in roll form for application in the field.

The fastener strip roll **100** shown in FIG. **7** comprises a backing tape or sheet **102** having a plurality of spaced fastener elements **104** secured thereto at a fixed distance from one edge **106** of the sheet **102.** The elements **104** thus are accurately positioned relative to this edge to facilitate positioning of the strips **104** and makes peeling of the sheet **102** from the panel more difficult since the stress is applied to the sheet **102** by the strip **104** away from the edge of the sheet **102.** Preferably a fold line **108** is provided in the sheet **102** at the side edge of the fastener elements **104** adjacent the edge **106.** This fold line **108** facilitates folding the sheet **102** about a corner of a panel as shown in FIG. **8** to improve the strength of the connection between the panel and sheet **102.** A sheet **102** may be secured to the back of the panel such as panel **110** indicated in FIG. **8** by any suitable adhesive. The adhesive may be preapplied to the sheet **102** and be protected by a strippable tape **112** (FIG. **7**). Preferably a pressure sensitive adhesive is preapplied so it is merely necessary to separate the tape **112** and press the sheet **102** against the back surface of the board **110** to fix the sheet in position. The sheet **102** preferably is relatively inexpensive material for example a suitable paper sheet.

A plurality of discrete elements **104** have been illustrated, however, a continuous strip **114** of fastener elements may be used if desired as shown in FIG. **9.** When a continuous strip is used, however, it will be necessary to use the relatively rigid hook members described hereinabove or special accommodations will have to be made to provide the resilient means tensioning the loop and hook members to limit relative sliding movement. The use of a continuous strip reduces any alignment problems between the fastener on the stud and on the panel to a minimum.

The sheets **102** which are equivalent to the kraft paper strips **28** need not extend the full length of the panel as illustrated, for example, relatively short lengths could be cut and applied to the back of the panel if the spacing of the loop members on the stud is not equivalent to the spacing between the fastening elements **104** on the sheet **102** (the fastening element **104** are equivalent to the fastening element **26**).

While the disclosure has illustrated mounting of **48** inch wide panels which requires the centre row of fastener elements **26** as shown in FIG. **3,** it will be apparent that with narrower panels the centre row may be omitted. Similarly spaced or discrete fastening elements **26** and **30** have been provided on the panel **16** and stud **12.** These elements **26** and **30** may be replaced by a continuous strip running the height of the panel or stud (as illustrated in FIG. **9** for example) but,

of course, this would increase the cost and could result in too strong a connection with the result that dismantling becomes difficult. Preferably if a continuous strip is used it will be used for either the fastener element **26** or **30** but not both.

The operation of the instant invention will be apparent from the above description. The panels such as **14, 16, 18, 20, 22** or **24** are simply moved into position against the studs **12** and the fastening elements **26** and **30** cooperate to secure the panels in position. The panels are moved in a direction substantially perpendicular to their face both to apply them and to remove them when erecting or dismantling the partition to facilitate both erection and dismantling of the partition.

The description has dealt entirely with partitions incorporating studs or the like. However, the system may be used to mount decorative panels at any suitable location, for example, the studs may be replaced by filling strips on solid concrete walls or by simply Velcro strips applied to any supporting structure on which the panels are to be mounted. Similarly the strips have been illustrated as running longitudinally of the panels (vertically). They may also extend transversely of the panels.

Modifications may be made without departing from the spirit of the invention as defined in the appended claims.

We claim:

1. A partition structure comprising stud means, a plurality of discrete spaced fastening elements secured to said stud means, a substantially rigid wall panel, co-operating fastening elements secured to said panel and positioned to co-operate with the fastening elements on said stud means, one of said fastening elements and said co-operating fastening elements being in the form of a plurality of loops the other in the form of a plurality of T-shaped hooks formed from plastic and adapted to hook into said loops thereby to secure said panlel to said stud means, said loops being small and said hooks being substantially rigid and having short stems, said hooks and loops being interposed between said panel and said stud means, and constituting means for inhibiting relative movement between said panel and said stud means.

2. A partition structure as defined in claim **1** further comprising resilient pads interposed between and bearing against said stud means and said panel and positioned between said discrete fastening elements.

3. A partition structure as defined in claim **1** wherein said cooperating elements are secured to a backing strip having substantially more area than said cooperating elements and said backing strip is secured to said panel over substantially the full area of said backing strip.

4. A partition structure as defined in claim **1** wherein said fastening elements are said loops and are secured to said stud means by staples.

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