COMPOSITE SIDING USING A SHAPE MOLDED FOAM BACKING MEMBER

This application is a continuation of U.S. patent application Ser. No. 11/648,266, filed Dec. 29, 2006 now U.S. Pat. No. 7,908,814. U.S. patent application Ser. No. 11/648,266 claims the benefit of Provisional Patent Application Ser. No. 60/755,221, filed on Dec. 30, 2005. Both of these applications are incorporated herein by reference in their entireties.

BACKGROUND

The present disclosure pertains to sidewall foam backer panels to be used as siding elements attached to elongated siding panels having a vinyl or other polymeric veneer profile for an exterior wall of a building.

The construction industry, both new construction and remodeling presents opportunities for the use of composite siding panels having a veneer of a vinyl or other suitable decorative polymeric material connected to foam insulating backers. Such materials can be generally referred to as insulated siding.

Typically, the insulated foam backer is prepared by the initial formation of the polymeric foam by placing suitable polymeric material in a suitable expander machine where precursor resin is transformed from its granular state to pellets in an expanded state. The expanded pellets are conveyed to a suitable molding machine where they are subjected to heat and steam pressure to create a block, typically 50.times.50.times.216 inches. The block is cut to a desired profile using a computer-controlled hot wire cutting machine. A suitable number of beads/lines of permanently flexible adhesive are applied to the prepared insulated foam backer and a vinyl siding product having a matching profile is adhered to the prepared foam insulation backer. To date, the most efficacious adhesive materials are hot-melt type adhesives.

The overall "block molding" method and resulting product are not without problems. It has been found that hot-wire cutting operations performed on the foam block in order to provide the desired insulated foam backer profile also relieve stresses and introduce camber into the material cut from the sides of the foam block. As used herein, the term "camber" describes the problem of the insulated foam backer material exhibiting lateral bow. This problem can arise because the block of expanded foam polymeric material has various densities and moisture gradients throughout its profile. Cutting the foam block material can release stresses resulting in the outside panels being cambered. The significance and intensity of the problem can increase depending upon the length and/or width of the foam block and the resulting composite siding product. It can be appreciated that siding products of greater length and width are desirable for ease and efficiency in installation in various construction projects. It should be noted that backers exhibiting camber frequently jam in the factory lamination equipment making it difficult to align and bond the respective materials. Backers having camber measured from side edge to side edge of more than ½ inch per piece over the length of a piece are typically scrapped.

Additionally, the surface profiling operation presents its own problems and drawbacks. The hot wire cutting equipment is limited to two (2) dimensional cutting. Heretofore, the blocks of expanded foam were formed and hot wire cut to provide the desired shape or contour. Additionally, any side or interior surface contour must be imparted by suitable processes that, many times, are implemented separate from the initial foam formation and foam backer formation process.

It can be appreciated that additional handling necessary for the formation of geometric regions and features can increase the complexity of the manufacturing process and can increase the opportunity for damage and the like. The cutting processes previously necessary to produce the contoured insulated foam backer panel can result in a backer panel having undesirable wire marks and roughed surfaces. Such rough surfaces can contribute to unsightly, irregular siding appearance, increased handling and processing, less breakage. Additionally, the roughened surface can have adverse effects on the effectiveness of adhesives and the appearance of any materials overlying the surface.

Thus, it would be desirable to provide an insulated siding construction suitable for use in outdoor applications such as homes and the like that utilizes a three (3) dimensional shape molded insulated foam backer. The EPS foam backer material is the most likely material for this use. However, other materials may be suitable to shape molding.

SUMMARY

Disclosed herein is a unique shape molded foam backer panel designed and molded to provide a superior foam backer that will support and insulate a 12½ feet siding panel. The backing member also includes a rear face and an opposed front face and is composed of closed cell expanded polymeric shape-molded foam. The front and rear faces are composed of closed polymeric cells. The backing member is configured with at least one three dimensional feature such as front face geometric features, rear face geometric features and vertically oriented side features.

DESCRIPTION OF THE DRAWINGS

The description makes reference to the accompanying drawings wherein like reference numerals refer to like reference characters throughout the several views and in which:

FIG. **1** is an exploded view of an insulated siding unit having a shape molded insulated foam backing member as disclosed herein;

FIG. **2** is a cross-sectional detail of abutting insulated siding panels of FIG. **1**;

FIGS. **3**A and **3**B are cross-sectional views of two interlocking composite backers positioned in top to bottom abutting relationship;

FIG. **4**A is a detail cross-sectional view of two abutting side edges of insulated foam backer units. The vinyl panels show the unique new siding panel overlap and indentation feature of FIG. **1**;

FIG. **4**B is an alternate version of FIG. **4**A;

FIG. **5** is a cross-sectional view of a portion of the insulated siding panel element of FIG. **1** shown in place on a wall;

FIG. **6** is a detail cross sectional view of the insulated foam backer and the composite insulated siding panel;

FIG. **7** is a cross-sectional of top-to-bottom abutting insulated foam backer panels with the corresponding siding panels assembled and shown mounted on a wall;

FIG. **8** is a front elevational view of a portion of a shape molded foam insulated siding backer panel;

FIG. **9** is a detail front elevational view of a portion of the panel of FIG. **8**;

FIG. **10** is a front elevational view of the backer member of the composite insulated siding panel of FIG. **8** with the siding layer removed;

FIG. **11** is a detail front elevational of the upper portion of the backer member of FIG. **10**;