Title: CONSTRUCTION FRAMING MEMBER WITH INTEGRATED THERMAL BREAK

Abstract: In an embodiment, a framing member has an inner member portion, an outer member portion, and an insulating member interposed between the inner member portion and the outer member portion. The insulating member has a lower thermal conductivity than either the inner member portion and the outer member portion and a lower structural strength than either the inner member portion and the outer member portion. Holes can be made through the insulating member without the use of electrical appliances. Methods of manufacturing the framing member are also provided. Also provided is a wall comprising a plurality of framing members and a method of installing a framing member.
CONSTRUCTION FRAMING MEMBER WITH INTEGRATED THERMAL BREAK

FIELD OF THE INVENTION

This invention is in the field of building and framing construction materials, and more specifically, dimensional framing members with an integrated thermal break which can be used in various construction applications.

BACKGROUND

Improvements in building construction materials and methods are constantly sought to enhance the comfort and economy of residential and commercial buildings. One of the areas in which a large amount of effort is currently concentrated is in the development of alternate materials and construction methods that increase energy efficiency. Heating a home or building is futile and ineffective if the house or building is not properly sealed and insulated; gaps in the structure of the building as well as thin, non-insulated walls allow heat to transfer out of the building and increase heating costs, as well as they result in uneven heating levels within the building. In addition to the increased cost of energy for heating the building, there is also undue damage to the environment due to the increased amounts of heating fuel or energy which are consumed to keep these buildings at comfortable temperatures. As such it is desirable to provide or enhance the effect of insulation in the walls of houses or buildings to prevent or minimize heat loss.

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Typical walls of a building or a house are often manufactured with dimensional lumber or other stud materials, having a gypsum or other type of wall board on the interior of the building. Vapor barrier may also be used between the interior wall surface and the studs or dimensional framing members which provide structure to the wall in the building. The studs act as an inner member framework which, along with providing structure and support for the wall itself, also support wall coverings, windows and doors. They also provide mounting cavities or mounting surfaces for electrical wiring, plumbing, HVAC systems and other utilities.

Standard dimensional lumber or other aluminum or steel stud materials are often used to construct or member portion these walls. Most often interior walls are generally member portioned with 2" x 4" wall studs, although sometimes 2" x 6" wall studs would be used to provide more strength. Typically the studs or framing members are placed a predefined standard spacing apart, for example either every 16 or 24 inches. Extra studs can be used or provided wherever walls intersect, or to provide a nailing area or additional support.

Batts of insulation would typically be installed in the spaces between framing members inside a wall to provide insulation and reduce heat loss through the cavities between the framing members. To the exterior of a building wall there is often an air barrier and some kind of an exterior surface or siding which is attached through to the studs.
Insulation batts are important in providing insulation in the areas of the cavities between the framing members. Some common forms of insulation batts are made from fiberglass, mineral wool, or cotton. These batts are fibrous sheets that are long and wide enough to fit snugly between wall studs. Another form of insulation is loose-fill insulation, which is a light fibrous fill. This type of insulation is laborious to install and typically requires a professional installer. Furthermore, this type of insulation is easily affected by air movement. There is also spray-applied insulation that can fill cavities very well, but again, must be applied by a specialized contractor.

An effective insulation system will prevent the movement of air through the system. If there are any cavities, they will be filled with insulation, leaving no gaps in or around the insulation, and furthermore, will not compress the insulation. The structural members in the wall oftentimes act as thermal bridges, extending from the warm side of the insulation to the cold side of the insulation, allowing for an easy escape of heat. While insulation batts installed in the cavities between the framing members provide some insulation to a building, the framing members or studs of the wall allow heat transfer to occur from the warm side to the cool side of the wall through the framing members themselves. This problem is further emphasized with the use of metal member portions instead of wood, because much more heat flows through metal studs and joists than through pieces of wood.
There have been many attempts to prevent heat loss through thermal bridges such as the framing members. One of the most popular methods of preventing this type of heat loss is to provide some type of rigid, board-stock insulation on the exterior face of the studs, usually expanded polystyrene or insulation batts. However, installation of this type of insulation on all the exterior faces of the studs involves wrapping the entire house with a rigid foam batt, or similar type of insulation product, which is very expensive and labour intensive. Again, this type of material can also be an irritant or hazardous during installation and will often require professional installation.

Another attempt to minimize this type of heat loss is to space the wall studs at 24 inches apart, rather than 16 inches apart. This extra spacing between the studs reduces the total number of studs in the wall, thus reducing the surface area of the framing members available for heat transfer. However, the reduction in the number of total framing members reduces the strength of the wall. As such, it is not desirable to reduce the number of framing members, if possible.

Furthermore, the reduction in framing members does not eliminate, or even minimize, the heat loss that will occur through the remaining framing members.

A further attempt to minimize heat loss through wall studs uses a method of staggering the wall studs that appear next to one another. A first wall stud would be situated against the inner wall leaving a gap between the first wall stud and the outer wall, and a second wall stud adjacent the first wall stud would be situated against the outer wall leaving a gap between the second wall...
stud and the inner wall, whereby the wall studs would alternate positions as such along the wall. In this way, a given stud will not concurrently contact the materials of the inner wall and the materials of the outer wall, and will consequently be unable to transfer heat directly from the inner wall, through to the stud, to the outer wall and out of the building. However, there are many drawbacks associated with this method, as well. This method of reducing heat loss through studs is very labor intensive and expensive, as each stud needs to be perfectly placed in relation to the studs next to it. This furthermore increases the thickness of the wall and reduces the strength of the wall since each of the inner wall and the outer wall are only provided with one half of the number of wall studs for support.

Prior attempts to minimize heat loss through wall studs furthermore do not address the issue of the difficulty in installing plumbing and electrical work within the walls. It is currently inconvenient to install plumbing and electrical services in walls because the wall studs act as obstacles to the wiring and piping. As such, currently, holes need to be drilled through each of the framing members in order to run wiring or pipes through the walls. This type of work is not only inconvenient, but also expensive and laborious.

**SUMMARY OF THE INVENTION**

In an embodiment of the present invention, a framing member and a wall can minimize heat transfer through the framing member. In an embodiment, the inner member portion and the outer member portion of the framing members are separated along their minor faces with a
substance having a lower thermal conductivity than the framing members, minimizing or eliminating direct contact between the inner and outer member portions. This separation can act as a thermal break that stops or minimizes the conductivity between an inner and outer wall via the framing member, and in this way can reduce heat transfer across the framing member and through the wall. The framing member can be easy to install and can allow electrical wiring and pipes to be run through the wall without the need to drill holes in the rigid material of the framing members using power tools. Accordingly, the framing member of these embodiments could be applied to any buildings, including houses and apartment complexes, to provide a convenient way to build a wall and reduce heat transfer to and from the building.

According to a broad aspect of the present invention, there is provided a framing member comprising an inner member portion, an outer member portion, and an insulating member interposed between the inner member portion and the outer member portion. The insulating member has a lower thermal conductivity than either the inner member portion and the outer member portion and a lower structural strength than either the inner member portion and the outer member portion. Holes can be made through the insulting member without the use of electrical appliances.

According to a further broad aspect of the present invention, a method of manufacturing a framing member comprises the steps of separating an inner member portion and an outer member portion by a space, and injecting foam insulation in the space which has a lower thermal conductivity than the framing members, minimizing or eliminating direct contact between the inner and outer member portions. This separation can act as a thermal break that stops or minimizes the conductivity between an inner and outer wall via the framing member, and in this way can reduce heat transfer across the framing member and through the wall. The framing member can be easy to install and can allow electrical wiring and pipes to be run through the wall without the need to drill holes in the rigid material of the framing members using power tools. Accordingly, the framing member of these embodiments could be applied to any buildings, including houses and apartment complexes, to provide a convenient way to build a wall and reduce heat transfer to and from the building.
conductivity and lower structural strength than the inner member portion and the outer member portion, wherein utility holes can be made therethrough without the use of electrical appliances.

According to a further broad aspect of the present invention, a method of manufacturing a framing member comprises the steps of providing an inner member portion and an outer member portion, providing a pre-formed insulation layer which has a lower thermal conductivity and lower structural strength than the inner member portion and the outer member portion, whereby utility holes can be made therethrough without the use of electrical appliances, and adhering the pre-formed insulation layer to inner faces of the inner member portion and the outer member portion.

According to a further broad aspect of the present invention, a wall comprises a plurality of framing members comprising an inner member portion, an outer member portion, and an insulating member interposed between the inner member portion and the outer member portion. The insulating member has a lower thermal conductivity than either the inner member portion and the outer member portion and a lower structural strength than either the inner member portion and the outer member portion. Holes can be made through the insulating member without the use of electrical appliances. The framing members are positioned so that all of the insulating members of the plurality of framing members are aligned to form a channel through which utility lines can be run through the insulating members of the framing members.
According to yet a further broad aspect of the present invention, a method of installing a framing member comprises the step of securing a framing member to form a framework for a wall, the framing member comprising an inner member portion, an outer member portion, and an insulating member interposed between the inner member portion and the outer member portion, the insulating member having a lower thermal conductivity than either the inner member portion and the outer member portion and a lower structural strength than either the inner member portion and the outer member portion. Holes can be made through the insulating member without the use of electrical appliances. The method further comprises the steps of forming a utility hole passing through the insulating member so that the utility hole passes through the framing member, and running a utility line through the framing member by running the utility line through the utility hole formed in the insulating member.

**DESCRIPTION OF THE DRAWINGS**

While the invention is claimed in the concluding portions hereof, preferred embodiments are provided in the accompanying detailed description which may be best understood in conjunction with the accompanying diagrams where like parts in each of the several diagrams are labeled with like numbers, and where:

- Fig. 1 is a side perspective view of a prior art framing member;
- Fig. 2 is a side perspective view of a series of framing members as shown in Fig. 1 forming a partial wall structure;
Fig. 3 is a side view of the series of the prior art demonstration of Fig. 2;

Fig. 4 is a fragmentary cross-sectional view of the series of conventional framing members as shown in Figs. 2 and 3 installed in a wall;

Fig. 5 is a side perspective view of one embodiment of a framing member in accordance with the present invention;

Fig. 6 is a side perspective view of a series of framing members as shown in Fig. 5, forming a partial wall structure;

Fig. 7 is a frontal view of a wall structure built from the framing members as shown in Fig. 5;

Fig. 8 is a side view of the wall structure as shown in Fig. 7; and

Fig. 9 is a fragmentary cross-sectional view of a wall formed using the framing members as shown in Fig. 5.

**DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS**

A framing member for installation in a wall having an integrated thermal break is provided. In an embodiment, a continuous insulating member, composed of a low-heat conductive substance, and of a length substantially equal to the length of the framing member, separates the inner and outer portions of the framing member, which can minimize heat transfer from the inner portion.
of the framing member to the outer portion of the framing member, thus eliminating or
minimizing the thermal bridge between the inner wall and the outer wall.

Fig. 1 illustrates a conventional framing member 10 as found in the prior art. The conventional
framing member 10 consists of an elongate block of rigid material, usually made of wood but
also sometimes made of other materials such as aluminum or steel. Fig. 2 illustrates a series of
conventional framing members 10 forming a partial wall structure 20. The partial wall structure
20 has framing members 10 held in place vertically at the top by a double top plate 22 formed by
laying two framing members 10 on top of one another. Fig. 3 shows the side of the partial wall
structure 20 formed by framing members 10. A framing member 10 acts as a bottom plate 24, or
base, for the vertical framing members 10.

Fig. 4 illustrates a series of conventional framing members 10 installed in a conventional wall
30. Wall 30 comprises a wallboard 32, typically made of gypsum, on the inside of a building. A
vapour barrier 34 is typically applied on the outside of the wallboard 32. The framing members
10, or wall studs, form a member framework for the wall 30 next to the vapour barrier 34. The
framing members 10 are generally spaced vertically every 16 or 24 inches, from centre to centre.
Cavity insulation 38 is provided in the spaces between the framing members 10, usually made up
of some type of insulation batts made out of fibrous sheets or loose-fill insulation. On the
exterior faces of the framing members 10 and next to the cavity insulation 38 there is provided a
rigid insulation 40, usually a board-stock insulation made up of polystyrene or other form of

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insulation batt, which covers the entire inner face of the wall 30. An air barrier 50, or sheathing membrane, is provided next to the rigid insulation 40 to prevent air movement within the wall. Finally, some sort of exterior façade 60 is provided, generally made out of brick or horizontal metal siding with fibreboard backing nailed through to the studs or framing members 10.

A framing member 100 in accordance with the present invention is illustrated by Fig. 5. The framing member 100 comprises an elongate inner member portion 102 and an elongate outer member portion 104, both made out of a rigid material. The rigid material could be any type of material which is suitable to provide support to a wall structure, and in some embodiments, may be wood. It is also contemplated that the material of the inner member portion 102 and outer member portion 104 could be a rigid material other than wood, such as metals including aluminum or steel, or plastic.

An integrated insulating member 110 that can act as a thermal break, is sandwiched between inner member portion 102 and outer member portion 104 and separates inner member portion 102 from outer member portion 104. In an embodiment of the present invention, the integrated insulating member 110 lies flush with, and completely separates, the inner and outer member portions 102, 104. In such an embodiment, framing members 100 can be placed side by side and in direct contact with one another, while still permitting the insulating member 110 to allow for a channel of insulating material across the framing members 100. Integrated insulating member 110 is, in one embodiment of the present invention, made out of a material which has a lower
thermal conductivity than the outer member portion 104 and the inner member portions 102. In a further embodiment, integrated insulating member 110 has less strength than the inner and outer member portions 102, 104. For example, integrated insulating member 110 could be made out of a foam plastic material such as polyurethane, but can optionally be made out of any other type of foam insulation or any other low-heat conductive material. It will be understood that a person skilled in the art would understand that various types of material could be used for the integrated insulating member 110.

It is specifically contemplated that in some embodiments of the framing member 100 of the present invention, it is desired to use an insulating member 110 which has a low enough strength that an installer can simply punch through the insulating member 110 with a utility line or the like to allow wires or pipes to run therethrough, and in any case, without the use of a drill or the like, but simply by the installer applying manual pressure to the utility line or hand tool. In this manner, the installer can install electrical wiring or plumbing in the wall using the framing member 100 by simply forcing the electrical wire or pipe through the insulating member 110 or using a hand tool to manually create a hole passing through the insulating member 110. This allows the wiring or plumbing to be done much faster because the installer does not have to use power tools to create the holes for the utility line to be run through.

In some embodiments, the material of the insulating member 110 can be at least slightly elastic so as to provide resilience to the insulating member 110 and to reform around the utility line or the like after a hole is punched therethrough. For example, the integrated insulating member 110
could be made out of expanded polystyrene foam insulation, extruded polystyrene foam or any type of urethane-based foam product.

The width of the integrated insulating member 110 can be generally between ½ inch and 1 inch, though the width could vary depending on the heat conductivity of the material and the thickness required to obtain the desired degree of insulation. The integrated insulating member 110 can be bonded in place to the inner member portion 102 and outer member portion 104 using bonding materials such as lamination or glue, though any materials that securely attach the insulating member 110 to the member portions 102 and 104 could be used.

Still in reference to Fig. 5, each framing member 100 is formed by joining two portions of a rigid elongate member of generally rectangular cross-sectional shape, one half constituting the inner member portion 102 and the other half constituting the outer member portion 104. In one embodiment, nails or screws could be applied through the inner member portion 102, through the insulating member 110, to the outer member portion 104, in order to secure the relative parallel positions of the inner member portion 102 to the outer member portion 104 and to provide further strength to the framing member 100.

In one embodiment of the framing member 100, the framing member 100 could be pre-manufactured by the lamination or attachment of the inner member portion 102, the outer
member portion 104 and the insulating member 110 such that the actual framing contractor or carpenter who was using the framing members 100 of the present invention to construct the wall with an integrated insulating member 110 could simply be able to build or frame the wall in accordance with regular or conventional techniques such as cutting the framing members 100 to the approximate or appropriate lengths required and then attaching them using conventional methods to form a wall structure.

Beyond on-site manufacture of the framing member of the present invention, it is contemplated that in a method of manufacturing a framing member 100, the framing member 100 could be pre-manufactured by attachment of the integrated insulating member 110 or insulation portion to the inner member portion 102 or the outer member portion 104 by gluing, laminating or otherwise attaching same such that the completed framing member 100 can be delivered to the construction site and used interchangeably with other dimensional lumber in framing applications using conventional cutting and attachment techniques. A method of manufacture of the framing member of the present invention could comprise attaching an integrated insulation layer 110 to an appropriately sized inner member portion 102 and then an appropriately sized outer member portion 104, yielding, when completed, a three-layer completed framing member 100.

The framing member 100 could be pre-manufactured or preassembled, through the attachment of the inner and outer member portions 102, 104 and the integrated insulating member 110 by means of lamination or other attachment means in advance of delivery or use at a construction site.
Alternatively, the framing member 100 could be assembled on site at the construction site using inner and outer member portions 102, 104 and insulating member 110 which could be glued, laminated or otherwise attached together at the construction site.

The size of the inner member portion 102, outer member portion 104 and insulating member 110 could each be adjusted for a number of reasons. For example the thickness of the insulating member 110 could be thickened or thinned based upon the particular thermal requirements of the application in which the framing member 100 when assembled would be used. Also, the inner member portion 102 or the outer member portion 104 might be sized appropriately such that their utility in conventional construction techniques would be maximized i.e. such that they would still most strongly support fasteners attached thereto, etc. In one embodiment, the complete framing member 100, including the inner member portion 102, the outer member portion 104 plus the integrated insulating member 110 could in total be approximately the same size as a standard dimensional framing member, for example in total being the approximate dimensions of a standard 2 x 4 or 2 x 6 framing member, such that it could be easily interchanged into pre-existing construction methods and market acceptance of the product could be maximized. The dimensions of the member portions 102 and 104 can vary and furthermore, the width of the inner member portion 102 and the outer member portion 104 can be equal, or one member portion 102 or 104 could be larger in width than the other member portion 104 or 102, depending on its purpose and the load that each of the member portions 102, 104 are meant to bear. If the framing member 100 was manufactured in accordance with the dimensions of pre-existing types of dimensional lumber, the framing member 100 could be interchangeably used
with any different number of types of pre-existing hardware or the like. It will be understood by
one skilled in the art that there is no specific ideal dimension for the framing member 100 of the
present invention but that any number of different pre-existing dimensional lumber sizes could
be copied or mimicked using the framing member 100 and method of assembly of the framing
member 100 of the present invention.

In one example, if the framing member 100 were manufactured using inner member portion 102
and outer member portion 104 of lumber, and an insulating member 110 of polystyrene glued
therebetween, it will be understood that those types of materials used in manufacturing the
framing member 100 of the present invention would yield a framing member 100 which could
easily be cut with conventional lumber saws. Even in terms of providing a thermal break in a
metal studded framing member, the inner and outer member portions 102 and 104 could be
manufactured from aluminum, steel or other conventional metal materials and the insulating
member 110 which was chosen could be glued therein or otherwise attached between those
portions. Again, by choice of the appropriate materials for the member portions 102 and 104 and
the insulating member 110, conventional cutting and attachment techniques could also be
accommodated.

Fig. 6 illustrates one embodiment of a series of framing members 100 in accordance with
forming a partial wall structure 120. The partial wall structure 120 has a plurality of framing
members 100 held in place vertically at the top by a double top plate 122 formed by laying two
framing members 100 on top of one another. The double top plate 122 and the vertical framing members 100 are securely attached in a manner such that the insulating member 110 in each framing member 100 of the double top plate 122 and the vertical framing members 100 are aligned to form a channel that is unimpeded between adjacent framing members 100. The insulating members 110 of the framing members 100 and double top plate 122 which form the channel can be made out of a material which has a low enough strength such that holes 162 can be made therethrough without the use of a drill or other electrical appliance. Holes 162 can be made by a user simply pushing through the insulating members 110 using their hands or tough implements, such as a screwdriver, in a consecutive series through the framing members 100.

Utility lines 165, such as pipes, electrical wiring, etc. can then be placed through the series of holes 162. In this way, pipes and wires 165 can be run through holes 162 made in the insulating members 110 lengthwise of the wall structure 120. It is also contemplated that the holes 162 could be made by the user applying pressure on the insulating members 110 with the utility line 165 itself, which could cause a hole 162 to be punched therethrough and which would simultaneously run the wire or utility line 165 through the insulating members 110.

Figs. 7 and 8 illustrate a wall member portion 170 using the framing members 100 of the present invention. The framing members 100 are secured in such a manner to form a member framework for the wall. A plurality of framing members 100 are spaced vertically. These vertical framing members 100 can be held in place by a header 122, which can also be a framing member 100 including an insulating member 110, extending along the length of the top of the wall member framework 170. The header 122 can be adhered to the vertical framing members
100. A bottom plate 124, which can also be a framing member 100 having an insulating member 110, can extend along the lower length of the wall member framework 170. The bottom plate 124 can also adhered to the vertical framing members 100. The header 122 and bottom plate 124 can be secured to the vertical framing members 100 in such a manner that the insulating member 110 of each the header 122, bottom plate 124 and each of the vertical framing members 100 are aligned and form a channel running the length of the wall member portion 170. It is contemplated that any number of framing members 100 can be laid one on top of the other to create the header 122 or bottom plate 124, as necessary to provide the appropriate structure and support required for the wall. Optionally provided are fireblocks 175, that are interposed horizontally between the vertical framing members 100 in order to support the vertical framing members 100. The fireblocks 175 and the vertical framing members 100 can be secured in such a manner that the insulating members 110 of the fireblocks 175 and vertical framing members 110 form a continuous channel. The insulating members 110 of the framing members 100, fireblocks 175, and bottom plate 124 which form the continuous channel can be made out of a material which has a low enough strength such that holes 162 can be made therethrough without the use of a drill or other electrical appliance. Holes 162 can be made by a user simply pushing through the insulating members 110 using their hands or tough implements, such as a screwdriver, in a consecutive series through the framing members 100. Utility lines 165, such as pipes, electrical wiring, etc. can then be placed through the series of holes 162. In this way, when a utility line 165 needs to be run through the wall, the utility line 165 can be run through holes 162 in the insulating members 110 lengthwise of the wall member framework 170. It is also contemplated that the holes 162 could be made by the user applying pressure on the insulating members 110 with the utility line 165 itself, which could cause a hole 162 to be
punched therethrough and which would simultaneously run the utility line 165 through the insulating members 110.

The header 122, bottom plate 124, and fireblocks 175 can be secured to the vertical framing members 110 using glue and/or a nailing device, though other methods of securing them to each other are also possible as will be evident to one skilled in the art.

Fig. 9 illustrates a method of framing a wall 130 using the framing members 100. This method can comprise the steps of securing the framing members 100 into a wall member framework 170 configuration forming a channel of insulating members 110 running lengthwise through the member framework 170 and installing the same into the wall 130. In an embodiment, two or more framing members 100 can be placed side-by-side and in contact with one another in order to provide increased support, while still allowing a channel of insulating members 110 between the two or more framing members 100. The wall member framework 170 can be associated with any usual or conventional wall by replacing the standard framing members or wall studs of the conventional wall with the framing members 100. The framing members 100 could be manufactured in any nominal length in order to build a wall 130 that is thermally separated with the channel formed by the insulating members 110 in the vertical framing members 100 and also in the header 122 and bottom plate 124. In the installation of a framing member 100, wires or pipes can optionally run through the walls 130 through holes punched through the foam insulation or insulating member material 110. Holes can be pre-punched through the insulating
member 110 prior to the wires or other utilities being run through the framing member 100, or optionally, the holes can be made by the wires or other utilities by applying pressure to the material of the insulating member 110 with the wires or pipes until the material of the insulating member 110 gives way to the wires or pipes, leaving a hole large enough to allow the wires or pipes to run therethrough. Aside from the wall member framework 170, the wall 130 has a number of variable features that could include a wallboard 132 on the inside of a building. A vapour barrier 134 can be applied on the outside of the wallboard 132. The framing members 100, or wall studs, form the member framework 170 for the wall 130 next to the vapour barrier 134. The framing members 100 are generally spaced vertically every 16 or 24 inches, from centre to centre, though any distance between vertical framing members 100 would be acceptable, dependent on the requirements of the particular wall 130.

Cavity insulation 138 can be provided in the spaces between the framing members 100, usually made up of some type of insulation batts made out of fibrous sheets or loose-fill insulation. Alternatively, the insulating member 110 can be composed of any number of different substances, including plastic or fiber, which can achieve a similar thermal break effect. Such thermal break substances will include mineral fibers such as glass wool or stone wool. On the exterior faces of the framing members 100 and next to the cavity insulation 138 there may provided an air barrier 150, or sheathing membrane to prevent air movement within the wall 130. Finally, some sort of exterior façade 160 may be provided, generally made out of brick, concrete, or horizontal metal siding with fibreboard backing nailed through to the studs or framing members 100.
Thus, a framing member 100 having an integrated insulating member 110 and a method of manufacture of the framing member 100, which comprises attachments of an insulating member portion 110 between an inner member portion 102 and an outer member portion 104 to yield a dimensionally appropriate complete framing member 100 which can be used in framing or construction applications interchangeably with other dimensional lumber.

The embodiments described herein have described the use of continuous insulating members forming a thermal break between inner and outer portions of a framing member or wall stud. It will be appreciated that the thermal break may be created using alternate methods and in alternate manners than as described herein. For instance, the thermal break could be formed by spraying an insulating material along the edges of the inner member portion or outer member portion such that a layer of insulating material is interposed between the opposing sides of the inner and outer member portions to prevent contact between the opposing sides. Alternatively, the thermal break could be formed by interposing separators, such as rivets, made out of an insulating material, between the opposing sides of the inner and outer member portions, preventing contact between the sides of the inner and outer member portions.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous changes and modifications will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and
accordingly, all such suitable changes or modifications in structure or operation which may be resorted to are intended to fall within the scope of the claimed invention.
What is claimed is:

1. A framing member comprising:

   an inner member portion;

   an outer member portion; and

   an insulating member interposed between the inner member portion and the outer member portion, the insulating member having a lower thermal conductivity than either the inner member portion and the outer member portion and a lower structural strength than either the inner member portion and the outer member portion,

   wherein holes can be made through the insulting member without the use of electrical appliances.

2. The framing member of claim 1 wherein the edges of the insulating member lie flush with, and completely separate, the inner member portion and the outer member portion.

3. The framing member of claim 1 wherein holes can be made through the insulating member by applying direct, manual force with a hand tool.
4. The framing member of claim 1 wherein the dimensions of the framing member are substantially equal to a standard 2 x 4 framing member.

5. The framing member of claim 1 wherein the dimensions of the framing member are substantially equal to a standard 2 x 6 framing member.

6. The framing member of claim 1 wherein the insulating member is made out of at least one of: expanded polystyrene; and extruded polystyrene foam.

7. The framing member of claim 1 wherein the insulating member is made out of a urethane-based foam product.

8. The framing member of claim 7 wherein the urethane-based foam product is polyurethane.

9. The framing member of claim 1 wherein the insulating member is adhered to the inner and outer member portions with at least one of: glue; and lamination.
10. The framing member of claim 1 further comprising at least one of screws and nails applied through the inner member portion, outer member portion and insulating member.

11. A method of manufacturing a framing member, the method comprising the steps of:

separating an inner member portion and an outer member portion by a space; and

injecting foam insulation in the space which has a lower thermal conductivity and lower structural strength than the inner member portion and the outer member portion, wherein utility holes can be made therethrough without the use of electrical appliances.

12. The method of claim 11 wherein the insulation is injected so as to lie flush with the edges of, and to completely separate, the inner member portion and the outer member portion.

13. The method of claim 11 further comprising the step of adhering the foam insulation to the inner and outer member portions.

14. The method of claim 13 wherein at least one of glue and lamination is used to adhere the foam insulation to the inner and outer member portions.
15. The method of claim 11 further comprising the step of interposing separators to separate the inner member portion and the outer member portion.

16. The method of claim 11 wherein the separators are made out of an insulating material.

17. The method of claim 11 wherein the foam insulation comprises at least one of: expanded polystyrene; and extruded polystyrene foam.

18. The method of claim 11 wherein the foam insulation is a urethane-based foam product.

19. The method of claim 18 wherein the urethane-based foam product is polyurethane.

20. The method of claim 11 further comprising the step of applying at least one of screws and nails through the inner member portion, outer member portion and insulating member.

21. The method of claim 11 further comprising the step of making utility holes through the foam insulation.
22. A method of manufacturing a framing member, the method comprising the steps of:

providing an inner member portion and an outer member portion;

providing a pre-formed insulation layer which has a lower thermal conductivity and lower structural strength than the inner member portion and the outer member portion, whereby utility holes can be made therethrough without the use of electrical appliances; and

adhering the pre-formed insulation layer to inner faces of the inner member portion and the outer member portion.

23. A wall comprising a plurality of framing members of claim 1 wherein the framing members are positioned so that all of the insulating members of the plurality of framing members are aligned to form a channel through which utility lines can be run through the insulating members of the framing members.

24. A method of installing a framing member, the method comprising the steps of:

securing a framing member to form a framework for a wall, the framing member comprising:
an inner member portion;

an outer member portion; and

an insulating member interposed between the inner member portion and the outer member portion, the insulating member having a lower thermal conductivity than either the inner member portion and the outer member portion and a lower structural strength than either the inner member portion and the outer member portion,

wherein holes can be made through the insulting member without the use of electrical appliances.

forming a utility hole passing through the insulating member so that the utility hole passes through the framing member; and

running a utility line through the framing member by running the utility line through the utility hole formed in the insulating member.

25. The method of claim 24 wherein the insulating member lies flush with the edges of, and completely separates, the inner member portion and the outer member portion.

26. The method of claim 24 comprising the step of installing a second framing member wherein the insulating members of the framing members form a continuous channel.
27. The method of claim 24 wherein the step of forming the utility hole in the insulating member comprises the application of manual pressure on the insulating member using the utility line.

28. The method of claim 24 wherein the utility line comprise one of: a water line; and an electrical line.

29. The method of claim 24 wherein the material of the insulating member is at least slightly elastic.
INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2011/000092

A. CLASSIFICATION OF SUBJECT MATTER
IPC: E04B 1/74 (2006.01) , E04F 21/06 (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
IPC (2006.01): E04B 1/74, E04F 21/06
EPC: E04B 1/74; 1/76C; 1/62; 1/14; 2/74; 2/74C5C
U.S. Cl.: 52/404.1, 404.2, 784.15, 794.1, 309.1, 309.4, 309.7, 506.01, 782.1, 782.2

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)
Canadian Patent Database, Epooke (EPODOC), WEST
keywords: framing member or element, stud, wall stud, vertical member, joist, post, composite, engineered, inslat+, thermal break, thermal bridge, sound break, polystyrene, vinyl polymer, EPS, XPS, styrofoam, polyurethane, PUR, PU, urethane, conduit, pipe, electric+, wire, cable, utility, utilities

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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[X] Further documents are listed in the continuation of Box C.  [X] See patent family annex.

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"O" document member of the same patent family

Date of the actual completion of the international search
05 April 2011 (05-04-2011)

Date of mailing of the international search report
11 April 2011 (11-04-2011)

Name and mailing address of the ISA/CA
Canadian Intellectual Property Office
Place du Portage 1, CT14 - 1st Floor, Box PCT
50 Victoria Street
Gatineau, Quebec K1A 0C9
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Authorized officer
Craig MacMillan (819) 934-3422
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