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(54) **SUPPORT PANEL FOR MASONRY**

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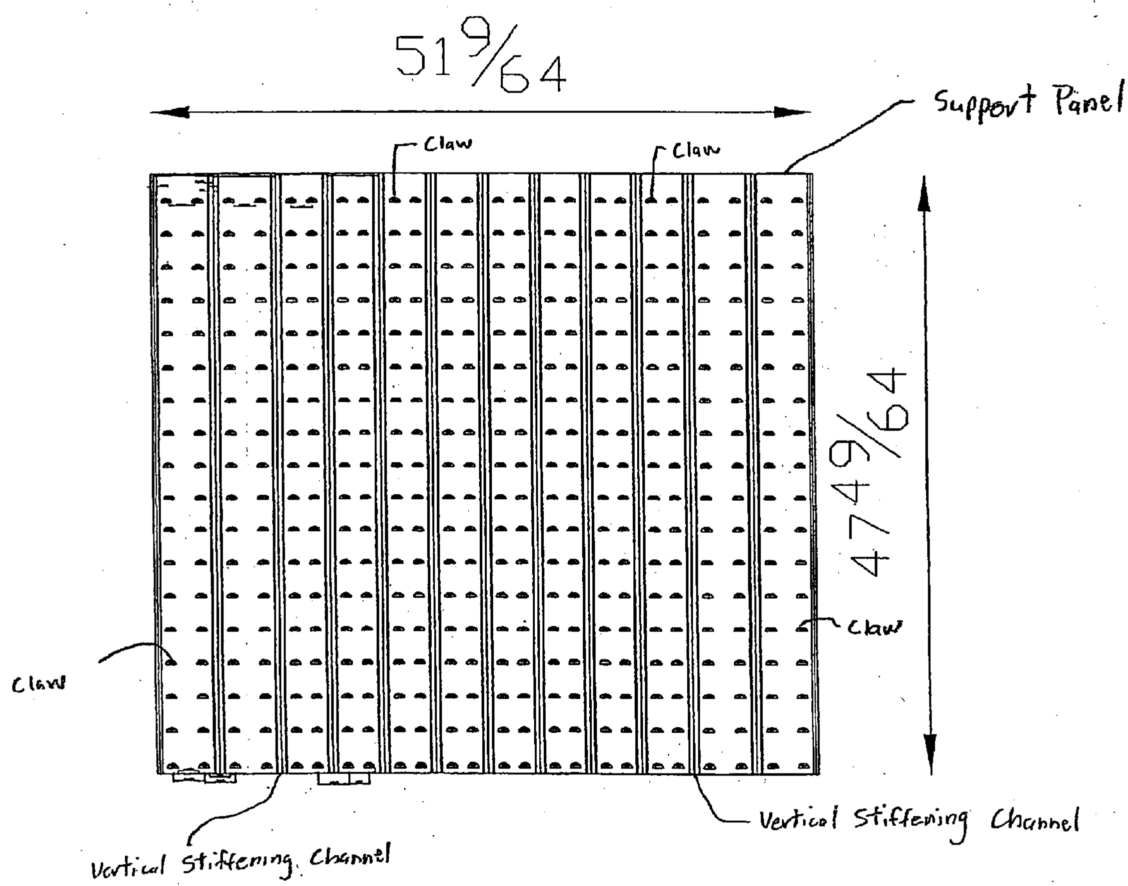
(57) **ABSTRACT**

A support panel for masonry objects that includes an inner surface, an outer surface, at least one stiffening channel formed longitudinally along the support panel, a plurality of substantially c-shaped claws extending from the outer surface, the claws being disposed in spaced apart relation to one another to form a grid, wherein the claws are configured to contactingly support at least a portion of a masonry object, and wherein the support panel is attachable to a wall of a structure via at least one fastener inserted into through the at least one stiffening channel into the wall of the structure such that the panel is spaced apart from the wall of the structure.



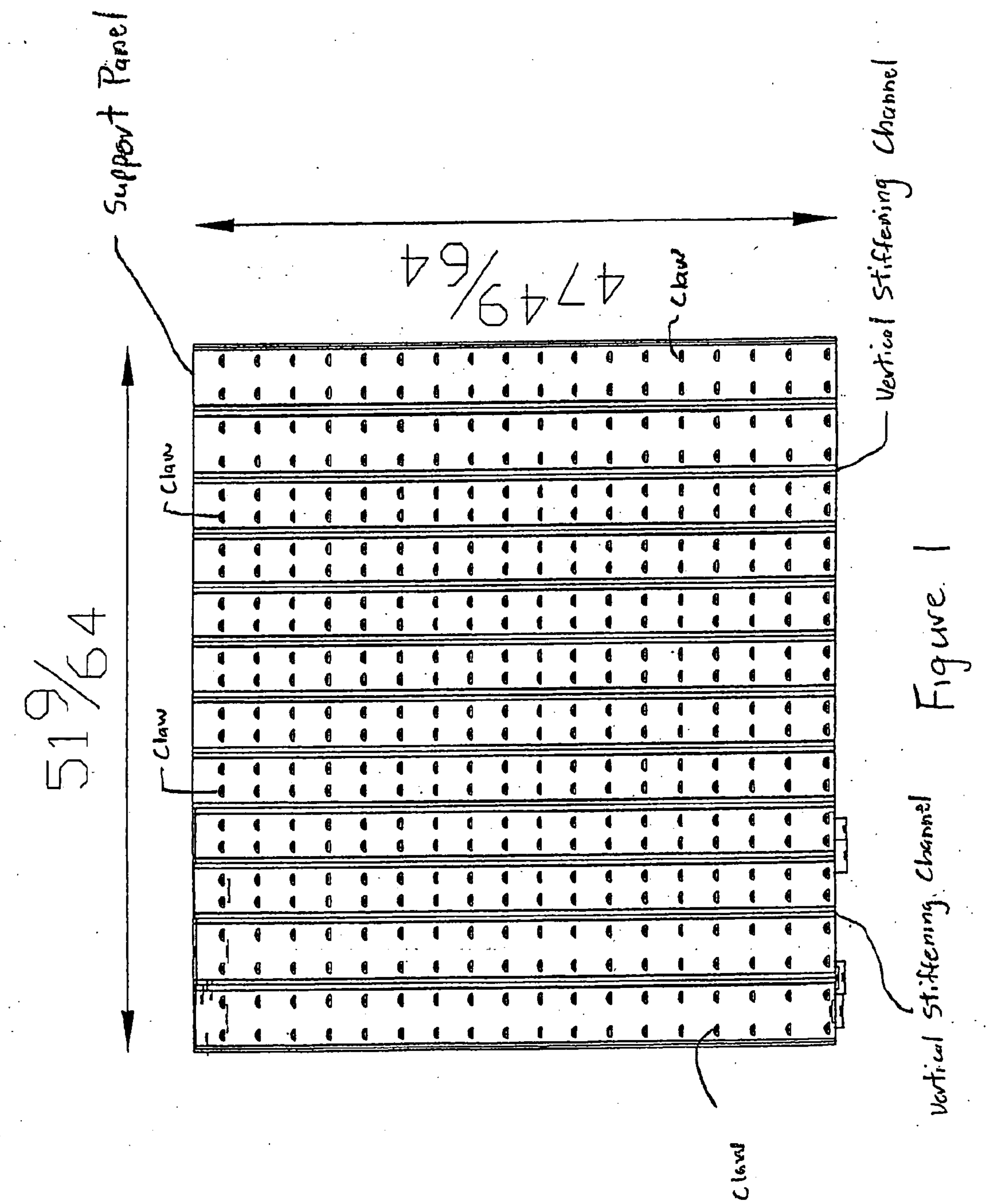

Support Panel
47 49/64
Claw
Vertical Stiffening Channel
Claw
51 9/64
Claw
Vertical Stiffening Channel
Claw

Figure 1

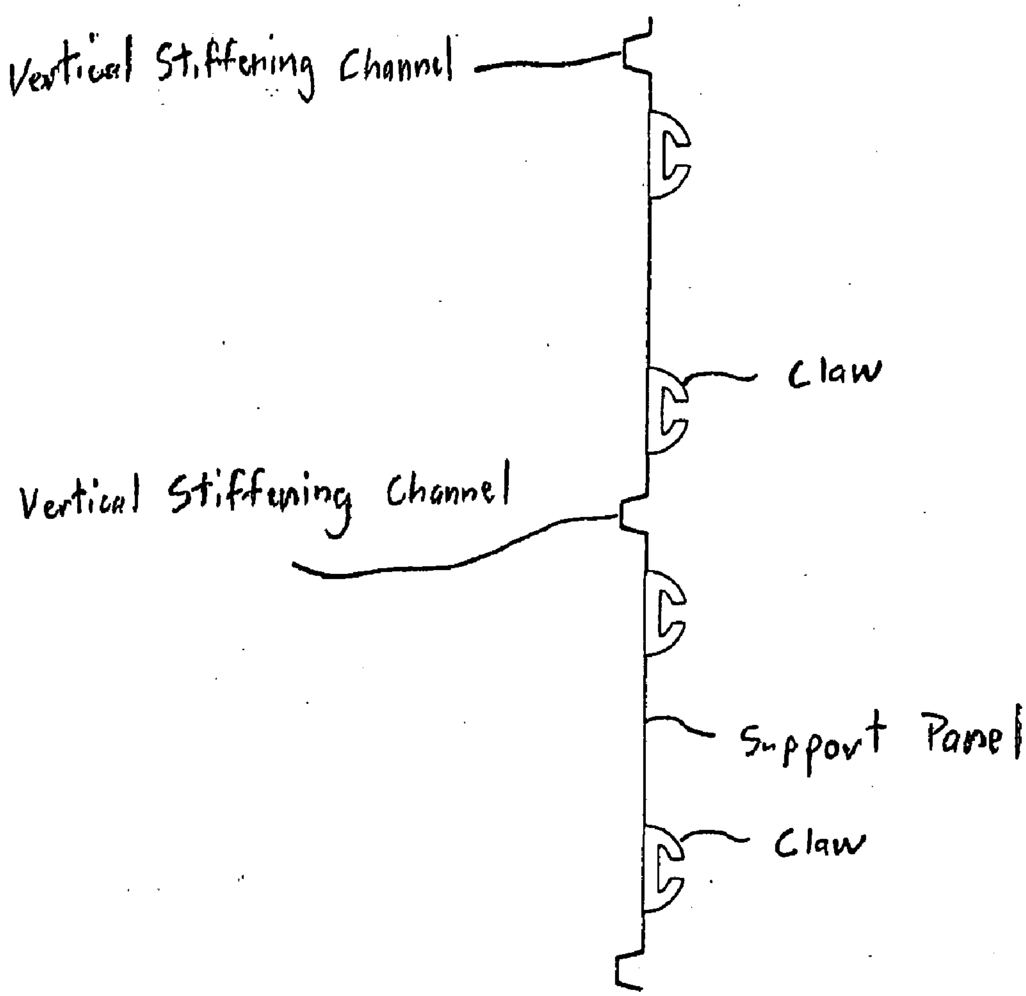

Vertical Stiffening Channel
Claw
Vertical Stiffening Channel
Support Panel
Claw

Figure 2

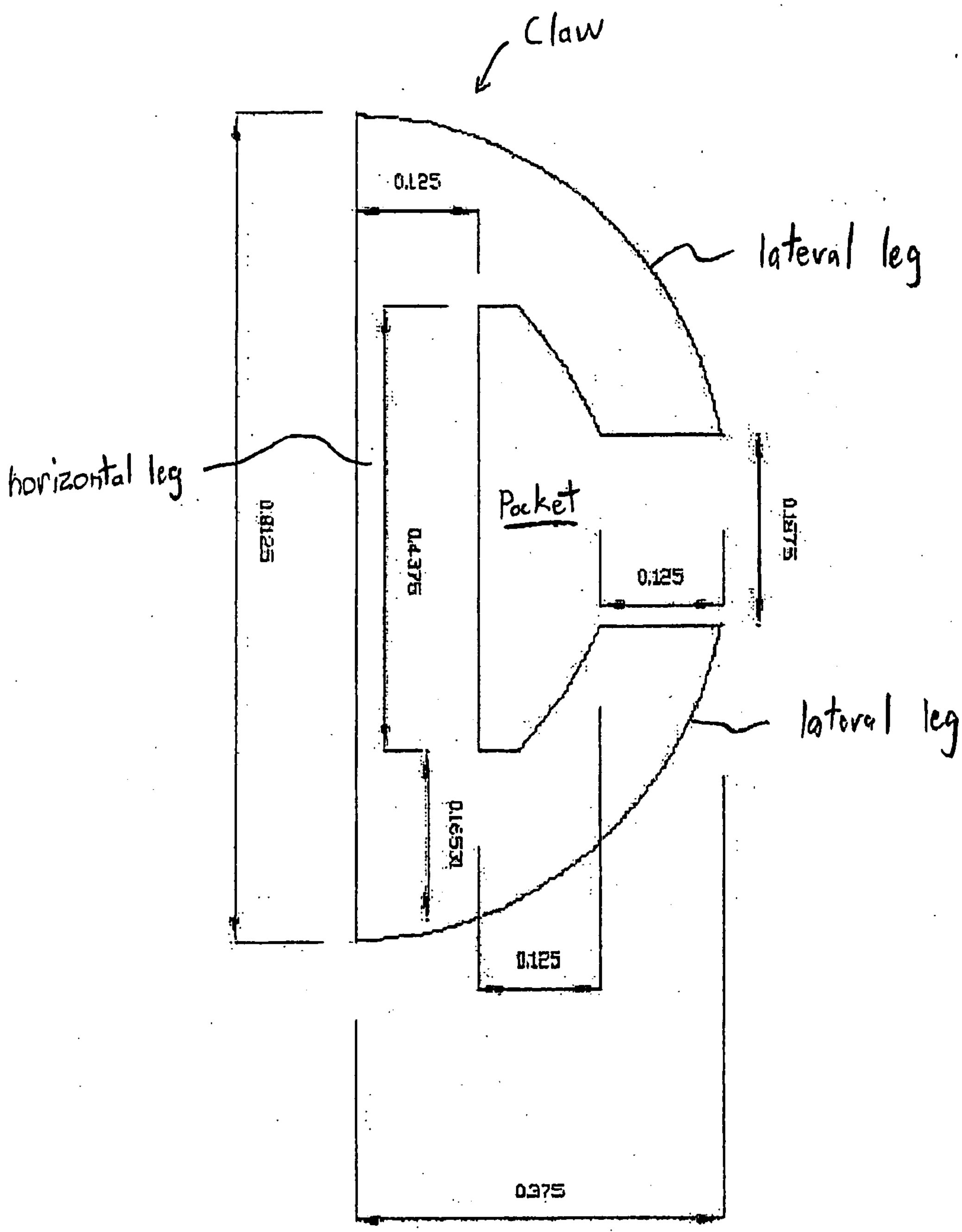

Claw
0.125
lateral leg
horizontal leg
Pocket
0.8125
0.4375
0.1875
0.125
lateral leg
0.1653
0.125
0.375

Figure 3

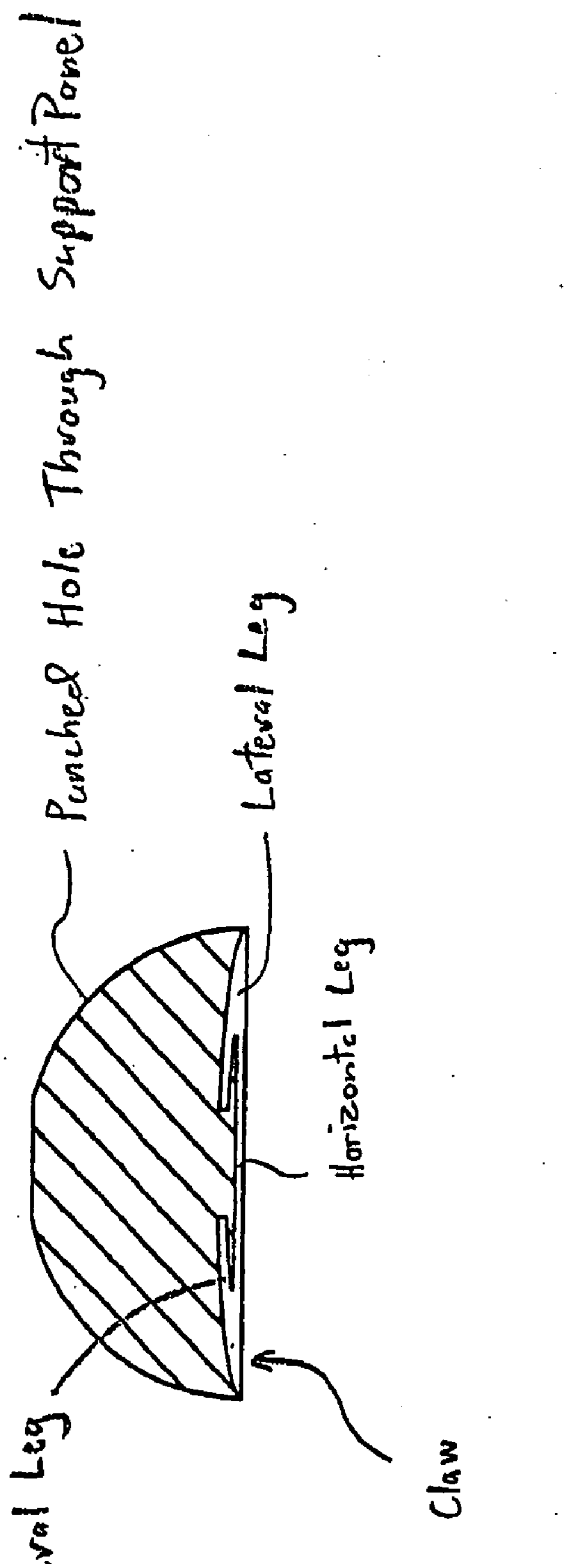

Punched Hole Through Support Panel
Lateral Leg
Horizontal Leg
Lateral Leg
Claw

Figure 4

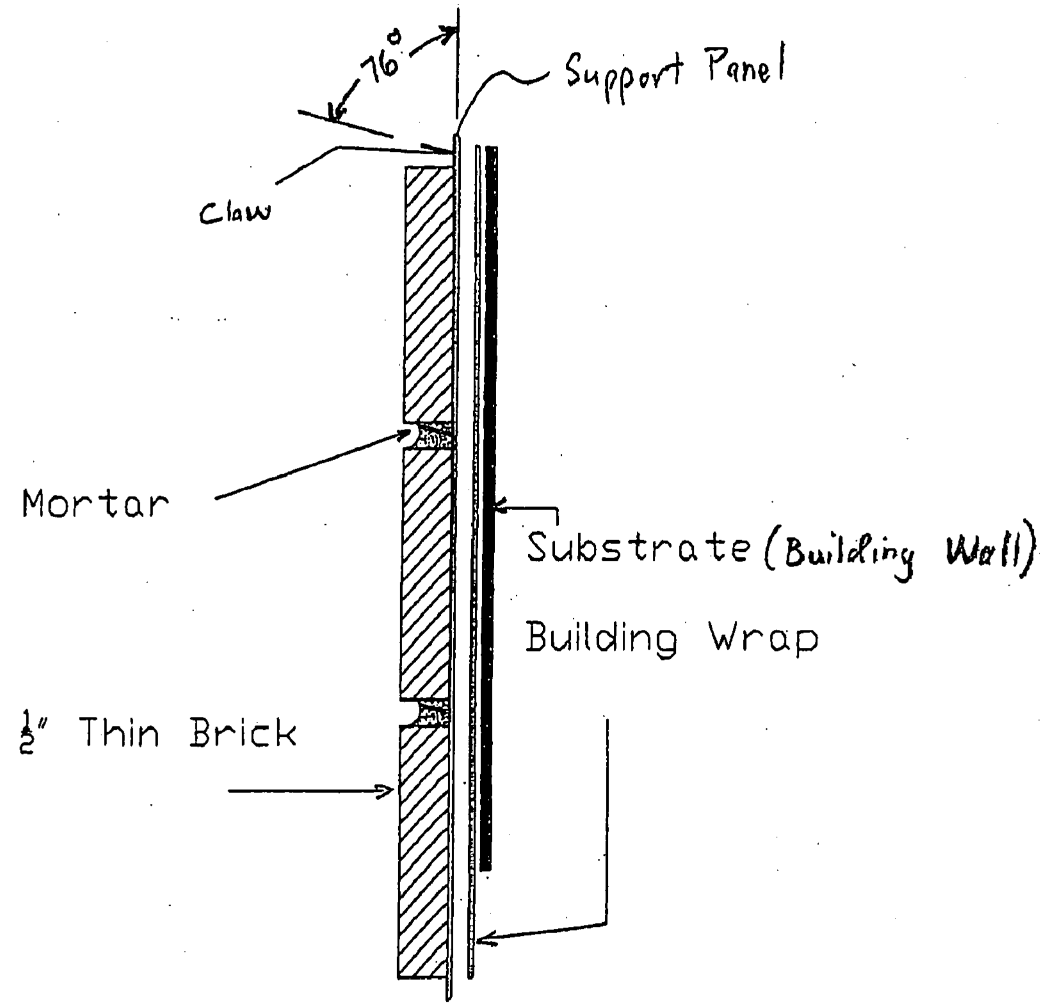

76°
Support Panel
Claw
Mortar
Substrate (Building Wall)
Building Wrap
½" Thin Brick

Figure 5

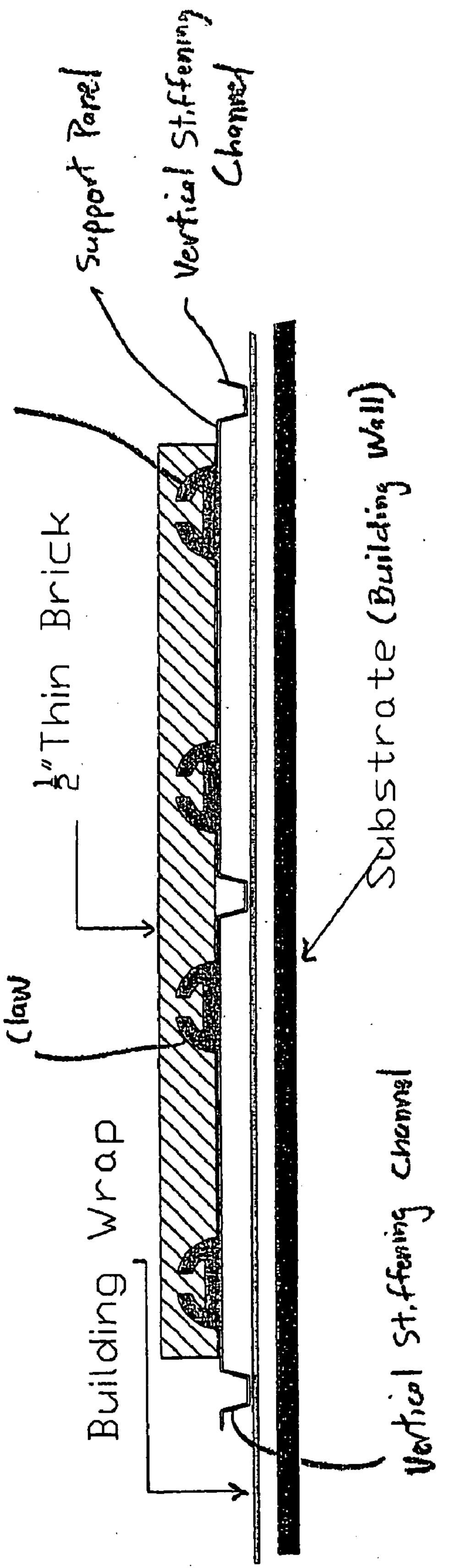

Claw
½" Thin Brick
Support Panel
Vertical Stiffening Channel
Substrate (Building Wall)
Claw
Building Wrap
Vertical Stiffening Channel

Figure 6

SUPPORT PANEL FOR MASONRY

CROSS-REFERENCE TO RELATED APPLICATION(S)

[0001] This application claims the benefit of U.S. Provisional Application Ser. No. 61/210,758, filed Mar. 23, 2009, entitled "SUPPORT PANEL FOR MASONRY," which is hereby incorporated herein by reference in its entirety, including all references cited therein.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to panels for supporting masonry, such as brick or stone veneers.

[0004] 2. Background Art

[0005] Thin brick and stone have been around for thousands of years. In the late 1700's, metal lathe was invented and used to support masonry on buildings and other structures. The use of metal lathe as a masonry support was introduced into the United States in the mid 1800's. The metal lathe was anchored to a wall of a building or structure, and then the cut brick or stone was bonded to the lathe and wall using a cement. This method, although reliable, was very labor intensive. Once the metal lathe was attached to the wall, workers would trowel the cement to the lathe and then lay the brick or stone into the cement. The lathe provided no guidance as to the placement and spacing of the brick or stone, and therefore, the workers would have to space every brick or stone one by one. The workers would either "eyeball" the spacing, or use implements for properly spacing the brick, such as pieces of wood, lengths of rope (which may be pulled out between the spacing before the cement sets) or even the worker's finger.

[0006] The metal lathe was in the form of a mesh or netting which was affixed to the wall of the building. The mortar or cement which was applied to this metal lathe mesh, with the brick or stone placed on the mortar, formed a solid backing which never allowed moisture to travel downwardly by gravity either between the wall and the lathe or the brick and the mortar. This trapped any moisture in pockets formed by gaps in troweling the mortar. This moisture would freeze and thaw with variations in the temperature, resulting in expansion and contraction, which would "pop" the brick or stone, causing it to loosen and possibly fall from the wall of the building or structure.

[0007] In the 1920's, the Klinglehut Corporation conceived the idea of gluing brick to an asphalt soft board. This board is an asphalt product, similar in some respect to a fiberboard, which is slightly compressible (that is, not as hard as metal or plywood). This board would be screwed onto the wall of the building or structure in substitution for the metal lathe. The brick or stone was then adhered to the board by using an adhesive. This adhesive would be similar to a construction cement, such as what is used when laminating plywood layers together or which is used for marine applications, and provides a very strong bond between the soft board and the brick or stone. Then, a mortar or cement is applied between the brick or stone glued to the soft board. This system was considered the first thin brick system, that is, using a brick veneer, which is generally about one-half inch in depth. This method was used for several decades.

[0008] In the 1970's, it became popular to use a method of attaching thin brick to foam panels using metal clips. The foam panels were similar to insulation board, such as those made by Dow Corning. With this method, the foam boards or panels were screwed into the wall of the building or structure. The foam panels had recessed channels formed horizontally in the outer surface of the panels, the transverse width of each channel being slightly greater than the width of the bricks. These channels are where the spaced apart bricks would be placed in a horizontal row, thus providing guidance for the bricklayer as to the placement of the brick on the support foam panels. Metal clips were placed on the outer surface of the foam panels and periodically spaced vertically and horizontally on the panels. The clips were L-shaped brackets which were about three inches wide by about two inches high. A vertical leg portion of the clip had a hole in which a screw passed through to fasten the foam board or panel to the wall of the building. A horizontal leg portion of the clip extended from the vertical portion outwardly from the outer surface of the foam panel. An adhesive was applied in one continuous serpentine line within each recessed channel of the foam boards, and the bricks were then placed in a horizontal row within each channel to contact the adhesive within the channel so that the brick bonded to the foam panels by the adhesive. Then, the cement or mortar was applied to the spacing between adjacent bricks both vertically and horizontally. The outwardly extending leg of each clip held the mortar in place after it had dried. The clips were spaced a predetermined distance from each other, as each clip was designed to support a certain square footage of mortar. The mortar, when applied, would actually wrap around the leg portion of the clips extending outwardly from the support panel, and this is what would supposedly keep the mortar in place on the wall. Thus, the clips were to interlock with the mortar, creating a mechanical support system.

[0009] There were several disadvantages using the foam panel system described above. The foam would ultimately deteriorate due to a chemical reaction with the mortar. Furthermore, the way in which the adhesive was applied, in a continuous serpentine line horizontally within each channel, created a dam that prevented moisture that collected behind the brick from flowing downwardly by gravity. Since the water would now collect behind the bricks, freezing and thawing of the water would cause the bricks to loosen. Furthermore, the channels which are formed in the outer surface of the foam panels in which horizontal rows of brick are placed create additional dams that prevent water and moisture from flowing downwardly by gravity between the foam panels and the bricks mounted on the foam panels. Again, this moisture and water collecting behind the bricks would freeze and expand, causing the bricks to loosen.

[0010] In the 1980's, the same concept of attaching thin brick described above but now using metal panels came into existence. The metal panels would have continuous rails running horizontally across the panels for supporting the bricks. The bricks were glued to the outer surface of the metal panels, and mortar was applied between bricks. This concept still had flaws. The continuous horizontally disposed rails along the panel still trap the moisture behind the brick, as the moisture and water could not flow downwardly due to the rails, and this sometimes forced the brick to loosen when a freeze/thaw cycle (when the temperature fluctuates below and above freezing) occurred. Furthermore, with this system, the panel laid flush on the wall of the building or structure, and thus did not provide an air/vapor cavity. An air/vapor cavity is important in order to allow moisture to escape and have an air flow between the panel and the wall to prevent the wall from deteriorating by rotting.

[0011] In the evolution of the masonry supporting system, the next change was to eliminate the rails and include periodically vertically and horizontally spaced apart, half moon-shaped tabs extending outwardly from the outer surface of the support panels. The tabs are spaced from each other, vertically, slightly greater than the width of the bricks, and the bricks are received between the vertically adjacent tabs. Each brick was attached to the outer surface of the support panel using adhesive placed in the four corners of the brick, and the brick was then positioned on the outer face of the support panel between vertically adjacent half moon-shaped tabs. Mortar was then applied to the vertical and horizontal spaces between adjacent bricks. One of the problems with this system was that the mortar never truly attached to the half moon-shaped tabs, and thus never created a mechanical bond with the panel. This system overcame some disadvantages of prior systems. The adhesive, being placed in the four corners of the brick, separated the brick from the panel a distance, such as one quarter inch, that allowed moisture and water to flow by gravity downwardly between the panels and the bricks mounted thereon, and through weep holes formed at the base of the brick veneer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. **1** is a front view of a panel used for supporting masonry, such as brick or stone, formed in accordance with the present invention.

[0013] FIG. **2** is a top plan view of the support panel of the present invention shown in FIG. **1**.

[0014] FIG. **3** is a top view of a claw formed in accordance with the present invention which extends outwardly from the outer surface of the support panel of the present invention shown in FIGS. **1** and **2**.

[0015] FIG. **4** is a front view of the claw formed on the support panel of the present invention and shown in FIG. **3**, with a corresponding punched hole formed through the support panel being illustrated by hatched lines.

[0016] FIG. **5** is a side view of a portion of the support panel, building wall, bricks and mortar, and illustrating the claw formed in accordance with the present invention and shown in FIGS. **3** and **4**.

[0017] FIG. **6** is a top view of a portion of the support panel, building wall and a brick, such as shown in FIG. **5** of the drawings, and illustrating the claw formed in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] In accordance with one form of the present invention, and as shown in FIGS. **1-6** of the drawings, a panel for supporting masonry, such as brick or stone veneers, is preferably made from a 27 gauge architectural grade steel panel. The panel size is nominally 48 inches by 48 inches, although it is envisioned to be within the scope of the present invention to form the steel panels with different sizes and from different gauge steel.

[0019] As seen in FIG. **2** of the drawings, each panel has a plurality of vertical stiffening channels which are spaced apart parallelly from each other at preferably about a 4 inch spacing so that a respective stiffening channel will be in alignment with a vertical stud of the wall of the building or structure to which the panel is mounted, such studs being spaced apart from each other about 16 inches measured center-to-center, in accordance with industry standards.

[0020] Preferably, the vertical stiffening channels are formed as an integral part of the steel panel by deforming the steel panel to form the stiffening channels. In effect, therefore, the vertical stiffening channels are recessed portions of the outer surface of the panel which extend outwardly from the opposite inner surface of the panel a predetermined distance, such as one half inch. The vertical stiffening channels are spaced apart horizontally from each other another predetermined distance, such as about two feet.

[0021] The vertical stiffening channels may include a plurality of holes situated along the length thereof and formed through the thickness of the panel, with adjacent holes spaced apart from each other a predetermined distance. Such holes are provided to accept a fastener, such as screws or nails, therethrough to mount the support panel to a supporting structure, such as the vertical studs of the building. Furthermore, the vertical stiffening channels allow the support panel to be mounted away from the wall of the building or structure and, therefore, provide an air/vapor cavity between the wall and the support panel to allow air and moisture to flow through this cavity. The vertical stiffening channels thus keep the panel away from the wall and allow equalization of air pressure behind the wall, thus guaranteeing constant air flow.

[0022] Another feature of the vertical stiffening channels, as its name implies, is to stiffen the panel to minimize its bending across the width and length thereof. Furthermore, since each vertical stiffening channel is formed as a recessed portion of the outer surface of the panel, the vertical stiffening channels provide a path for moisture and water to flow from between the outer surface of the panel and the inner surface of the bricks attached thereto.

[0023] Preferably, each support panel has a G90 galvanization rating accompanied by a two coat, thermo set, siliconized polyester paint finish to minimize rusting. Furthermore, the outer surface (and, if desired, the inner surface) of the support panel includes a stucco-embossed texture having raised and lowered portions. This texture serves two purposes. First, the texture adds more surface area to which the adhesive used to attach the brick to the support panel may bond. Second, the texture on the outer surface and the inner surface of the support panel provides a path for moisture to constantly travel downwardly, by gravity, between the brick and the support panel, thereby preventing moisture from accumulating behind the brick or stone mounted to the support panel, and provides a path for moisture to travel downwardly on the inner surface of the support panel which faces the building wall.

[0024] Preferably, an adhesive is used to bond the brick or stone to the support panel. A small one quarter inch dab of adhesive is placed at each corner of the brick on the rear surface thereof, and the brick is then placed against the support panel between vertically adjacent claws, as will be described in greater detail. The adhesive maintains the spacing between the brick and the support panel to allow moisture or water to flow downwardly by gravity between the outer surface of the support panel and the inner surface of the brick secured thereto.

[0025] FIGS. **4-6** illustrate the preferred form of each claw of the plurality of claws situated on the outer surface of the support panel. The claws are formed by a die punching through the thickness of the support panel from the inner surface of the support panel to the outer surface. Each claw includes a horizontal leg, and two oppositely disposed lateral legs extending from and in front of the horizontal leg, and joined to the front edge thereof near axial end portions of the horizontal leg. The horizontal leg and lateral legs preferably reside in the same plane and are formed from the same partially punched-out portion of the support plate. Overall, each claw has a semi-circular shape. Thus, each claw remains affixed to the support panel, and is bent outwardly from the outer surface thereof at a predetermined angle. The free ends of the lateral legs are spaced apart from each other a predetermined distance (preferably 0.1875 inches), and are positioned in front of the outermost edge of the horizontal leg to define therebetween a pocket or cavity for receiving mortar and to insure that the mortar adheres to each claw formed on or mounted to the support panel.

[0026] Furthermore, and as can be more clearly seen in FIG. **5** of the drawings, the horizontal leg and opposite lateral legs reside at the straight bottom edge of a semi-circular opening through the thickness of the support panel that is formed when the claw is partially punched out therefrom and bent outwardly along the straight bottom edge of the opening. The openings associated with the claws are also provided to allow the mortar or cement to enter therethrough and wrap around the steel support panel on the inner surface thereof. Thus, with the particular configuration of the claws of the present invention, the mortar will form a strong mechanical bond to the claws of the steel panel to interlock therewith.

[0027] Preferably, and as shown in FIG. **3** of the drawings, the preferred dimensions of the various components of each claw is as follows: The depth of the horizontal leg is preferably 0.125 inches; the width of the claw is preferably 0.8125 inches; the width of the pocket defined by the horizontal leg and the opposite lateral legs is preferably 0.4375 inches; the depth of the pocket measured between the outermost edge of the horizontal leg and the innermost edge of each lateral leg is preferably 0.125 inches; the width of each lateral leg measured at its free end is preferably 0.125 inches; the width of each lateral leg measured in proximity to the outer surface of the support panel is preferably 0.16531 inches; the distance which the lateral legs extend outwardly from the outer surface of the support panel is preferably 0.375 inches; and the spacing between the free ends of the opposite lateral legs is preferably 0.1875 inches.

[0028] Furthermore, as can be seen in FIG. **5** of the drawings, the horizontal leg and the lateral legs of the claw form an acute angle with the outer surface of the panel of preferably 76 degrees. This particular angle is chosen so that the lateral legs of each claw can support the brick above it on the lower surface of the brick, and yet provide a triangular area (in cross-section) defined by the outer surface of the support panel, the lower surface of the brick and the inner surface (facing the support panel) of the horizontal leg and the lateral legs of the lower claw on which the brick may rest to receive mortar to insure that the brick is secured not only to the support panel but also to the mortar, and such that the mortar surrounds each brick mounted on the support panel.

[0029] Preferably, the vertical spacing between claws on the support panel is approximately 2⅝ inches to allow a standard sized brick (or brick veneer) to be placed between the lateral legs of a lower claw and the lateral legs of an adjacent upper claw, as shown in FIG. **5**.

[0030] FIG. **6** shows a top view of the support panel and claws, with a brick placed against the outer surface of the panel. It should be noted from FIG. **6** that the horizontal spacing between adjacent claws is selected such that a single, standard sized brick or brick veneer is supported by, and extends across, several claws on the support panel.

[0031] The masonry support panel of the present invention is preferably used in the following manner. The support panel is attached to the wall of the building or structure (covered beforehand with a building wrap) by using fasteners placed through the spaced apart holes formed in the vertical stiffening ribs. Then, a dab of adhesive is placed in the four corners of the brick, and the brick is positioned on and adheres to the outer surface of the support panel between vertically adjacent claws and preferably supported by and resting on the outermost edges of the lateral legs of the claw or claws directly below it. One or more rows of bricks are applied to the support panel in this manner. Then, mortar or cement is added to the vertical spaces and the horizontal spaces between adjacent bricks, that is, where the claws are also located. Thus, the mortar not only forms a strong bond with the bricks, but also mechanically interlocks with the claws of the support panel.

[0032] The support panel of the present invention accomplishes three primary goals and overcomes the disadvantages of prior masonry support systems. First, the support panel of the present invention, with its vertical stiffening channels, keeps the panel away from the wall of the building or structure and thus provides a cavity for air and moisture to flow between the wall and the support panel. Second, the stucco-embossed texture, which may be formed on either or both of the inner and outer surfaces of the support panel, promotes moisture flow between the support panel and the wall of the building or structure and the support panel and the brick attached thereto. Third, the particular shape of the claws of the support panel of the present invention promotes a strong mechanical bond between the mortar and the support panel so that the two strongly interlock with one another.

[0033] It should be realized, of course, that the particular dimensions and spacing of the claws on the support panel may be changed to accommodate bricks or stone, or different types of masonry, of various sizes, and the spacing between the vertical stiffening channels may also vary to permit attachment of the support panel to a wall of a building or structure in order to accommodate a different spacing between studs or other supporting structure used in a building, or to address different stiffening requirements. Also, the support panels may be formed of different gauge steel than the preferred gauge disclosed herein to provide sufficient strength and rigidity to support the masonry attached thereto.

[0034] Although illustrative embodiments of the present invention have been described herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to those precise embodiments, and that various other changes and modifications may be effected therein by one skilled in the art without departing from the scope or spirit of the invention.

What is claimed is:

1. A support panel for masonry objects, comprising:

an inner surface;

an outer surface;

at least one stiffening channel formed longitudinally along the support panel;

a plurality of substantially c-shaped claws extending from the outer surface, the claws being disposed in spaced apart relation to one another to form a grid, wherein the claws are configured to contactingly support at least a portion of a masonry object; and

wherein the support panel is attachable to a wall of a structure via at least one fastener inserted into through the at least one stiffening channel into the wall of the structure such that the panel is spaced apart from the wall of the structure.

* * * * *