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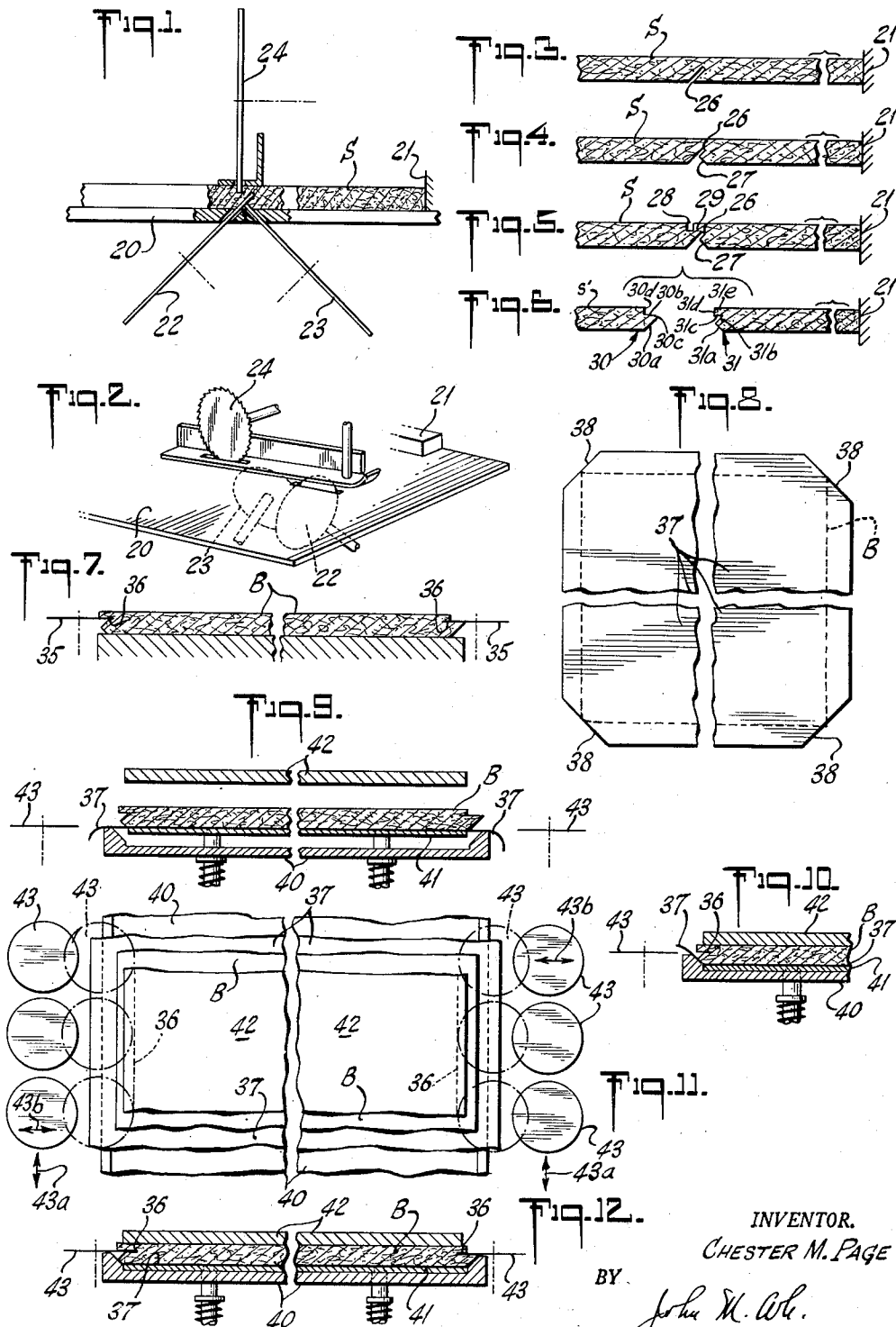
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WALL AND CEILING TILE

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2 Sheets-Sheet 1



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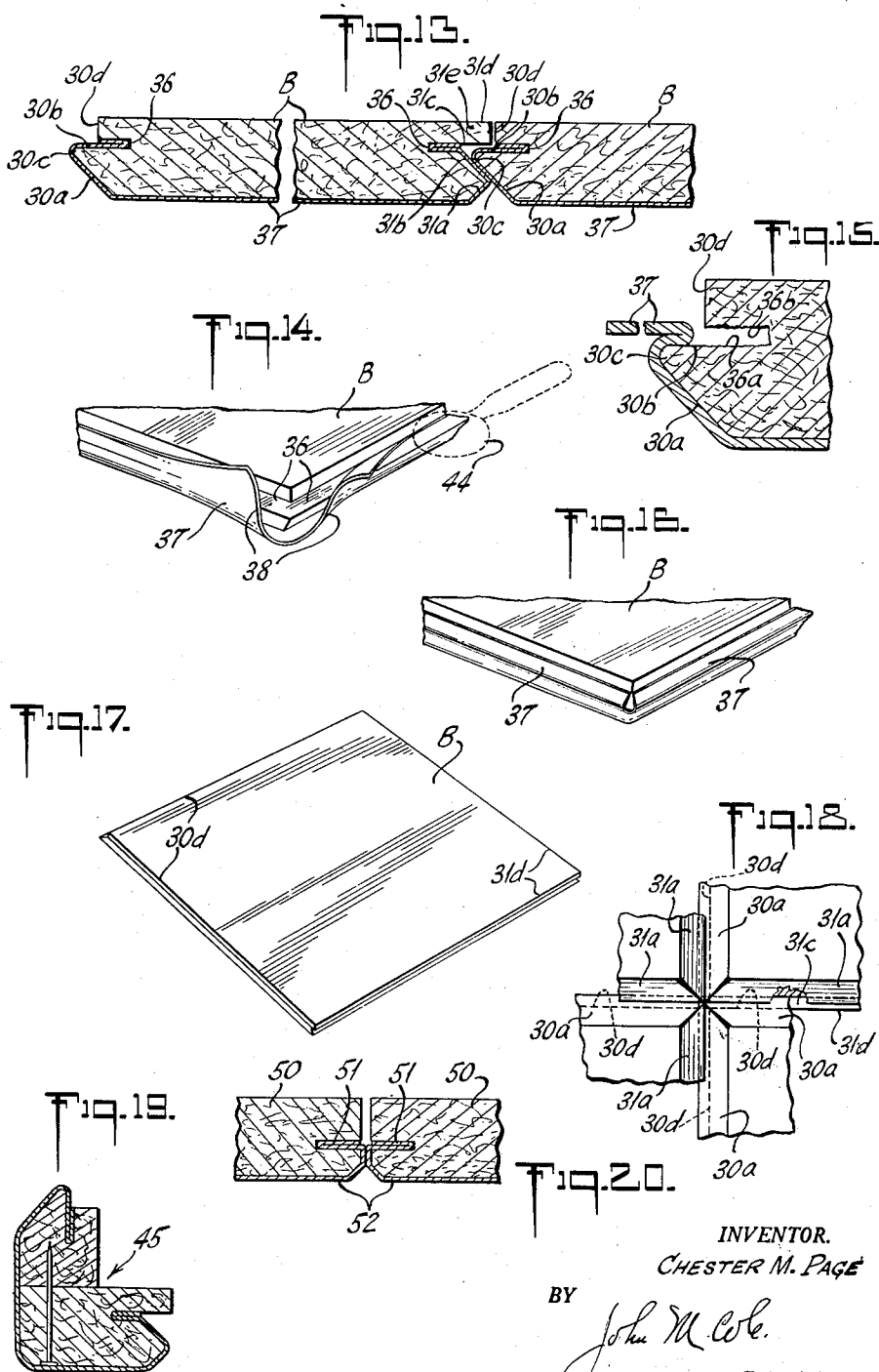
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2 Sheets-Sheet 2



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WALL AND CEILING TILE

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8 Claims. (Cl. 20-4)

The present invention relates to wall and ceiling tile and is more particularly directed toward tile having a body made of board-like material and provided with a covering sheet which is frictionally secured to the body of the tile.

According to the present invention tile blanks are cut from common types of composition wall board material such as the less expensive forms of cane-fiber board and pressed-wood fiber board, or the more expensive glass fiber board, styrene foam board, plywood, or lumber. Each of these materials has advantages and disadvantages for use as surfacing of a wall or ceiling. They require finishes in the form of paint, varnish, and the like, and may or may not be clean or waterproof. The tile contemplated by the present invention is provided with a covering which has a permanent surface and can be readily cleaned, whereby it is possible to obtain the advantages of cheapness of basic material, retain sound absorbing properties, and avoid the necessity of future finishing.

The tile blanks may have sides at right angles to the faces and may be beveled or not, or they may have interlocking tongues and grooves and beveled edges. While the blocks are typically rectangular so that they may be assembled in right angled patterns, they may be of other polygonal forms such as triangles, hexagons, etc.

According to the present invention at least two and preferably all sides of the blank are provided with narrow slots (or slits) extending therealong parallel with the front face of the tile. These slots have relatively rough walls so as to frictionally grip the covering material when it is forced into them.

The covering material employed is opaque, tough plastic sheeting, such as sheet vinyl, and it extends over the entire front face of the blank and back over the portions of the sides of the blank in front of the slots and is doubled over onto itself and forced into the slots so that two plies of the sheet material fill the slots and are frictionally gripped by the side walls. In this manner the covering is so firmly secured that application to the covering over the face of the blank of forces likely to be encountered in its use will not remove the doubled edges from the slots. This is accomplished without the use of adhesives which would require time to cure, or dry, and without the use of staples or other mechanical securing devices which would not satisfactorily hold the covering in place in the softer forms of material. Although the covering is securely held for all usual and normal purposes, one can readily remove it along an edge when it is desired to cut down the size of a tile so as to fit into a smaller space.

Other and further objects of the invention will appear as the description proceeds.

The accompanying drawings show, for purposes of illustrating the present invention, two forms in which the invention may be embodied, together with the method of making the tile blanks and the completed tile units, it being understood that the drawings are illustrative of the invention rather than limiting the same.

In these drawings:

Fig. 1 is a diagrammatic view illustrating the positioning of the saws used in cutting the tile blanks from the board-like material;

Fig. 2 is a perspective view of an arrangement of saws;

Figs. 3, 4, 5, and 6 are views illustrating the successive steps in severing a large sheet into two blanks;

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Fig. 7 is a diagrammatic view illustrating the cutting of the slots into the blanks such as formed in Figures 1-6;

Fig. 8 is a view to illustrate the shape of the covering sheet and its size relative to the tile blank to be covered;

Fig. 9 is a vertical sectional view illustrating the disposition of the covering sheet and the tile blank in the open assembling machine preliminary to the securing of the sheet to the blank;

Fig. 10 is a fragmentary sectional view similar to Figure 9 showing the machine closed;

Fig. 11 is a fragmentary top plan view of the same, also showing in dot and dash lines the inner position of the tools used for forcing the margins of the covering sheet into place;

Fig. 12 is a view similar to Figure 10 showing the position of the tools corresponding to the dot and dash lines of Figure 11.

Fig. 13 is a cross sectional view at an enlarged scale showing two abutting tile units such as made by the process shown in Figures 1 to 12 inclusive.

Fig. 14 is a perspective view illustrating a corner of the tile blank and a fragment of the covering having part of the margin in place in the slot;

Fig. 15 is a fragmentary view illustrating the relation of slot width to thickness of the doubled covering sheet;

Fig. 16 is a perspective view of a corner showing the covering in place;

Fig. 17 is a perspective view of a finished tile;

Fig. 18 is an elevational view showing four tiles joined; Fig. 19 illustrates an outside corner member; and Fig. 20 illustrates a modified form of tile.

In as much as the materials used for making the tile blanks are usually manufactured in large sheets and readily available as such, the first operations relate to conversion of these large sheets into smaller pieces which typically are squares and rectangles as these shapes fit the usual wall and ceiling countours.

In the preferred method of making the tile blanks the large sheets are first cut into narrow strips of the length of the sheet and these are again cut into shorter lengths, usually squares.

The machine of Figs. 1 and 2 has a saw table 20 of suitable size to support the sheet S and a guide 21, shown at the right. The sheet moves to the left, Fig. 2. Below the table are two power driven saws 22 and 23, preferably disposed at 45° to the plane of the table, one in front of the other and adjusted higher than the other, and above the table is a third saw 24 adjusted to cut down to a depth approximately that reached by the higher oblique saw. The saw 24 is preferably behind the other two.

The saw 22 makes an oblique saw cut 26 indicated in Figure 3. It extends part way through the sheet S, for example to a depth of $\frac{3}{8}$ " from the lower face. The saw 23 makes an oblique cut just deep enough to intersect the cut 26 at about the middle of this cut and the severed material is removed, so that the sheet now has, as shown in Figure 4, a square groove 27 and the upper part 2 of saw cut 26. The saw 24 cuts from above a saw cut 28 of a depth to be about opposite the top of saw cut 26. These cuts are preferably made in this order. The sheet S now has a narrow connecting portion 29 between slots 26 and 28.

The fibrous boards can readily be broken between these saw cuts so that the right hand edge of the left hand strip s' has the configuration shown in Figure 6 at 30 and the left hand edge of the right hand strip s'' has the configuration shown at 31. These are shown at a larger scale in Figure 13. The former configuration includes a relatively wide deep beveled surface 30a, a rearwardly facing surface 30b forming with 30a an acute angled nose 30c, and a rearwardly extending surface 30d forming with 30b an inside corner. The latter configuration (31) includes a narrow bevel 31a, a reverse bevel 31b, forming a right angled corner, a forwardly facing surface 31c and with a rearwardly extending surface 31d forming a flange 31e.

The strip s' is shifted over to the guide and again passed through the saw and the sawing repeated until

the large board is reduced to narrow strips having configurations 30 and 31 so that in cross section they appear as in Figures 7, 9, 10 and 13 where the blanks, or finished tile units, are shown. The strips *s''* is similarly edged, the guide 21 being shifted to the proper position.

The strips (edged along both side edges) are now turned through 90° and passed through the machine in the same manner so as to produce square or rectangular tile blanks B as shown in Figure 11. The flanges 31e, 30e, are adjacent and nose-like edges 30c, 30c are adjacent. In this way the square area of the rear surface of the blank is offset from the square area of the front surface.

In carrying out the operations above set forth from a sheet, say 4' x 8', one can cut thirty-two blanks one foot square in extreme dimension, but those blanks will not, when laid edge to edge cover 32 sq. ft. The effective area of each blank is $11\frac{13}{16}$ " by $11\frac{13}{16}$ ".

The method above described in detail is well suited for use upon the ordinary soft wall boards, but not for use with plywood or lumber as it may not break apart satisfactorily. If the configuration shown is desired for such materials it can be had by using tools of appropriate contour on blanks cut approximately to size. Any of the blanks may be used without covering if desired, as for example to provide accents.

To facilitate securing of sheet covering to the blank the blank is then, as shown in Figure 7, passed between two thin saws 35, 35 which enter the edges of the blank just back of the depth of the bevels (at the region of the break) so as to cut away irregularities and cut narrow slots 36, 36 parallel with the front face of the blank and about a quarter inch in depth in the material of the blank. These slots extend the entire length of the side of the blank and preferably along all four sides. The saw cuts have rough walls as indicated by the rough lines at 36a, 36b, Figure 15.

Figure 8 shows a covering sheet 37 for use with a rectangular tile. The sheet is square, with cut away corners 38 and is of such size relative to the tile blank B (shown in dotted lines in this figure) as to extend beyond it at all four edges, but not at the corners, and leave sufficient material to pass surfaces 30b, 31b and have just enough material to form a doubled edge in the saw cuts 36. A very desirable form of covering material is twelve gage vinyl sheeting without cloth backing or the like, to allow for some stretching. It is thick enough to have adequate strength, and flexible so as to be readily handled. It may be made up in a wide variety of colors so as to provide a finished surface which is permanent, easily cleaned, and not likely to be injured.

Figure 9 illustrates the principal parts of a machine for assembling the tile units. For clearness much of the operating mechanism is omitted. The process can be carried out by hand. The machine has a recessed bed 40 which carries an upwardly biased plate 41. A sheet 37 of the covering material is positioned face down on this plate 41, suitable guides (not shown) insuring the proper location. The blank B is then placed face down on the sheet and similarly aligned. The presser element 42 of the machine is then lowered as in Figure 10 and suitably held in position. This lowers the blank and covering into the recessed bed 40 which bends it upwardly as shown at the left of Figure 10 so that its edges are now above the level of the slots 36.

In the machine shown there are two rows of thin dull-edged rollers 43 mounted on a common carrier and normally spaced wider than the bed 40 of the machine and at an elevation to be opposite the saw cuts 36 in the blank, when the machine is closed as in Figures 10 and 12. In this closed position the edges of the covering sheet extend up past the rollers. These rollers are mounted for longitudinal reciprocation as indicated by arrows 43a and for lateral reciprocation as indicated by the arrows 43b.

The rollers are reciprocated back and forth and pressed toward the covering sheet to bring them to the dot and dash line position of Figure 11 or the full line position of Figure 12. This operation has formed the extreme edge into a fold and forced the fold into the slots 36—36, opposite one another, as shown more clearly in Figures 13 and 16. The saw cuts 36 have rough sides, and as shown in Figure 15 are narrower than the thickness of a doubled fold of covering material. The material of the blank yields sufficiently to allow the covering sheet

and roller to enter, but so tightly grips the covering sheet and presses the faces together after the rollers are removed as to prevent unintentional removal.

It is a simple machine for making square tile, the tile blank with covering attached along two opposite sides is removed from the machine, turned through 90° and the covering sheet similarly secured along the other two sides. Where manufacturing operations are carried out in a complex machine the clamped assemblage may be subjected to another pair of rollers or it may be shifted through 90° and treated by the same rollers. For non-standard sizes a hand roller such as indicated at 44, Figure 14, may be used.

The completed tile units may then be shipped and handled much the same as uncovered pieces of tile. The edges and corners are protected by the covering. The other tile are similarly treated with cement and forced against the wall and the previously placed tile or tiles so that the flanges pass behind noses. When the tile are thus assembled the covering sheets are tightly engaged along the joint and deeply beveled, tight, overlapping joints are provided as shown in Figures 13 and 18. The tile are self-leveling and aligning, but should there be shifting along the joint to open it up, the open joint would not be obvious.

If a tile is too large for a space, one can readily pull out the tucked-in edge, cut the blank with a knife, or other tool, trim off excess covering sheet, pull it tightly over the rear surface and secure it in place by staples or tacks. The doubled edges are returned to the slots by a putty knife and the smaller tile is secured in place. Inside corners and fittings to moldings are readily made and the finished job is free of visible means of tile support.

The corner number 45, Figure 19, made of narrow strips of material of any desired length properly edged and cemented or nailed together, and covered, is suitable for outside corners.

Where tile of square edge is desired ordinary precut tile, boards or the like such as shown at 50, Fig. 20, beveled if desired, are slotted as shown at 51. The covering material 52 is forced into the slots as above described. This treatment is particularly well suited where tile of modular dimension are available or required.

It is obvious that the invention may be embodied in many forms and constructions, and carried out in various manners, and I wish it to be understood that while particular forms are shown various modifications and changes are possible, and I do not limit myself in any way with respect thereto.

What is claimed is:

1. A tile unit for wall and ceiling surfacing, comprising a polygonal blank of board-like material having along its sides and intermediate the front and rear faces thereof longitudinal slits with sides in parallelism with the front face, and a covering of pliable sheet material extending over the front face and the sides, in front of the slits and having doubled edges forced into each slit, the double thickness of said material being slightly greater than the slit width whereby the covering is held in the slits by the frictional grip of the sides of the slits against the doubled edge of the sheet material.

2. A tile unit such as claimed in claim 1, wherein the slits and doubled edges extend about the entire periphery of the unit.

3. A tile unit such as claimed in claim 1, wherein one side of the blank has an outwardly and rearwardly flaring beveled surface leading back to the plane of the slits, and is cut back at the rear, so that that side edge has an acute angled nose, and the opposite side edge has a similar beveled surface leading part way back to the corresponding material receiving slit and a reversely beveled surface extending to the latter slit, the covered reversely beveled surface being adapted to overlie the nose of a similar tile, the beveled surfaces forming grooves at the joint.

4. A tile unit for wall and ceiling covering, comprising a rectangular blank of board-like material having along its four sides and intermediate the front and rear faces thereof longitudinal slits with sides in parallelism with the front face and a covering in the form of a rectangular piece of pliable sheet material of a size to cover the outer face of the blank, extend back to the slits and provide doubled edges of a thickness very slightly less than the slit width and of substantially the depth of the slits, the doubled edges being in the slits and being held

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there by the frictional grip of the same with the sides of the slits, the corners of the covering being cut away to avoid doubling at the corners of the blank.

5. A tile unit such as claimed in claim 4, wherein two adjacent edges of the blank are beveled from the front face to the plane of the corresponding slits therein and a portion of the material back of these slits cut away so that the covering material extends about nose-like edges, and wherein the other two edges of the blank have narrow bevels extending to reverse bevels which reach to the corresponding slits so that the nose-like edges of other similar tile may enter behind the reversely beveled portions.

6. A wall or ceiling tile comprising a polygonal blank of board-like material and adapted to be assembled with other similar tile to cover an extended area, wherein one side edge includes a rearwardly beveled surface deeper than one half of the thickness of the tile, a rearwardly facing surface behind the beveled surface and forming therewith an acute angled nose, and a rearwardly extending surface, the two back surfaces forming an inside corner, the opposite edge thereto including a rearwardly beveled surface of less than one half the thickness of the tile, a reversely beveled surface extending rearwardly therefrom to the same depth as the rearwardly beveled surface about the outer edge to form along the second edge an outside corner obliquely disposed with respect to the face of the tile, a forwardly facing surface behind the rearwardly beveled surface to form an acute angled recess adapted to receive the nose of an adjacent tile, and a rearwardly extending surface forming a flange with outside corner which may enter into the inside corner of the adjacent tile, there being slits cut into the body of the tile generally parallel with its faces at the extreme depth of the beveled portions, and a covering of sheet material about the front face of the tile and having doubled edges of slightly greater thickness than the slit width and forced into the slits so as to be frictionally held there.

7. A wall or ceiling tile unit of rectangular shape and adapted to be assembled with other similar tile units to cover an extended area, the front corner edges of the tile

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being beveled, two adjacent bevels being carried back farther from the front face than the other two, the material back of said two beveled edges being cut away at the rear so that the beveled edges form nose-like elements, the said other two edges being reversely beveled to accommodate the nose-like elements of other similar tile, each tile being provided with slits behind the nose-like elements and the reverse bevels and in parallelism with its faces, and a pliable covering sheet over the front face of the tile, the beveled and reversely beveled portions and having doubled edges whose thickness slightly exceeds the slit width and frictionally held in the slits, the covering having its corners cut away to avoid doubling, the covered tiles when assembled edge to edge having the covered nose-like elements of one tile entering behind the covered, reversely beveled portions of the edge of the adjacent tile.

8. A tile unit for ceiling and wall covering, comprising a sheet of soft pliable sheet material of generally polygonal shape with cut away corners, and a flat backing blank of corresponding polygonal shape of uniform thickness with uncut corners and of smaller size, the blank having along its sides and between its front and rear faces longitudinal slits parallel therewith and of slightly less width than twice the thickness of the sheet, the margins of the sheet extending about the sides of the backing blank forwardly of the slits and being doubled along their edges, forced into slits, and held there by friction.

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