Dec. 11, 1945. H. HUDGINS 2,390,712

DECORATIVE MATERIAL AND METHOD FOR PRODUCING THE SAME

Filed Feb. 11, 1943 2 Sheets-Sheet 1

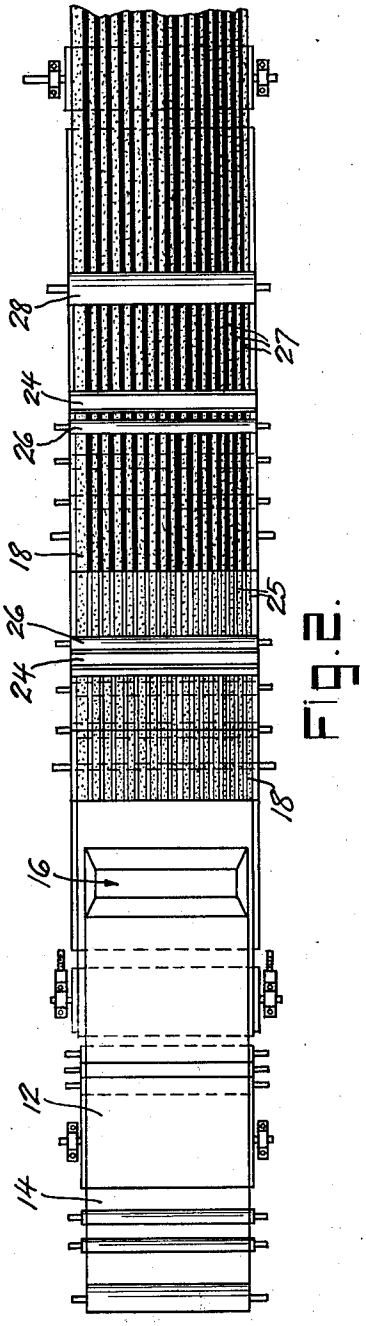


Fig. 2.

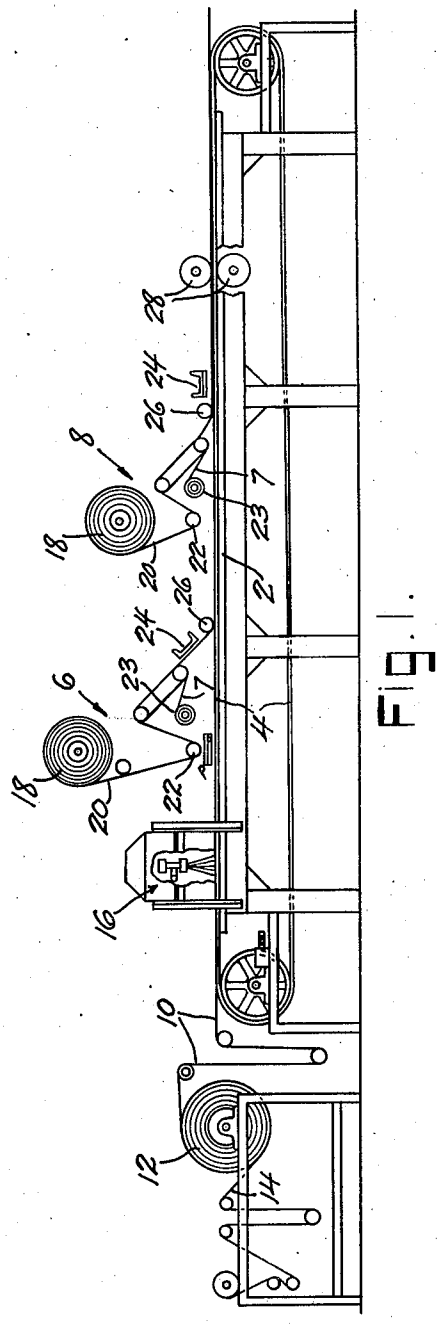


Fig. 1.

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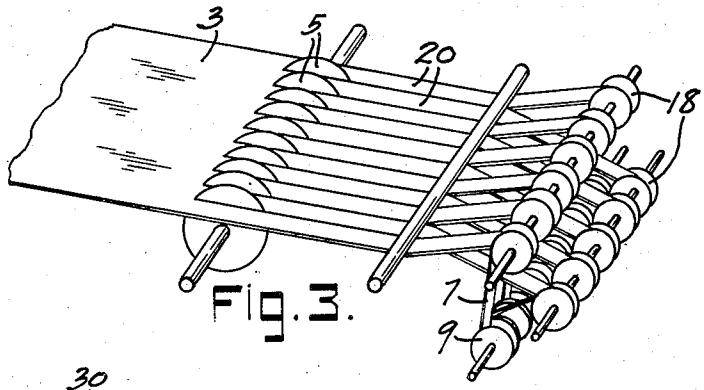


Fig. 3.

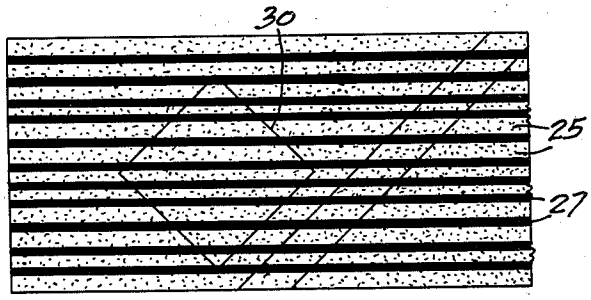


Fig. 4.

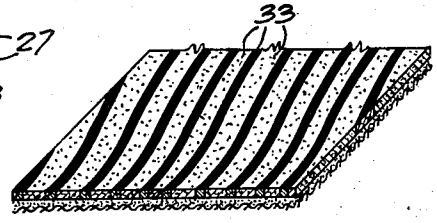


Fig. 7.

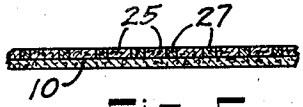


Fig. 5.

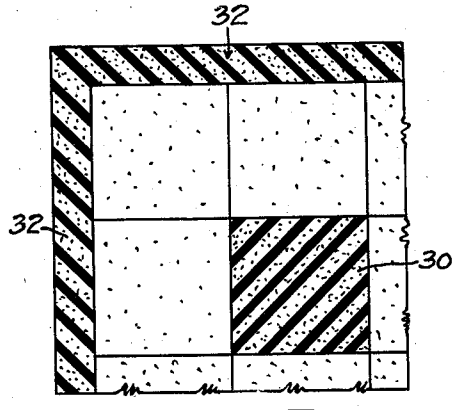


Fig. 6.

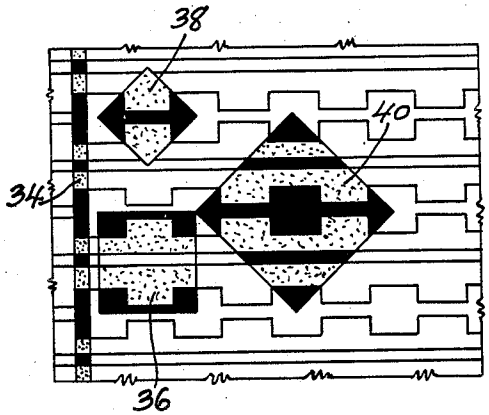


Fig. 8.

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UNITED STATES PATENT OFFICE

2,390,712

DECORATIVE MATERIAL AND METHOD FOR PRODUCING THE SAME

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Application February 11, 1943, Serial No. 475,572

6 Claims. (Cl. 154—26)

This invention relates to decorative materials having straight-line inlaid designs and adapted for use as floor covering, wall covering and for other purposes and to methods and means for producing such materials. This application is a continuation in part of my copending application Serial No. 342,453, filed June 26, 1940.

Heretofore in the manufacture of products such as linoleum floor covering having straight-line inlaid design it has been common practice to cut blocks or tesserae from a sheet or strip of linoleum and to arrange these tesserae in a design upon a base of burlap, saturated felt or other material. Thereafter the assembled tesserae are subjected to heat and pressure to secure them to the base and to each other.

This method is slow and expensive because it is necessary to use many small blocks or tesserae in order to produce an intricate and attractive pattern.

In accordance with the present invention these objections to methods and products of the prior art are overcome and novel methods and means provided whereby straight-line inlaid designs having a great number of relatively small design elements may be embodied in decorative material at little expense and in characteristic and novel arrangements which have not been obtainable heretofore or have only been capable of production at great expense. The present invention also is adapted for use in producing thick, yieldable and durable tesserae of a laminated type which may have a relatively thin and inexpensive layer of wear resisting or design forming surfacing material and relatively thick supporting layer or base of material chosen for its flexibility, durability, cushioning effect, low cost or for other properties desired in the finished product.

The advantages of the present invention are attained by forming an intermediate composite sheet of material which embodies a supporting layer which is continuous throughout the sheet and carries a surface layer formed of a plurality of pieces of differently colored material arranged in edge to edge relation to produce a preliminary straight-line inlaid design. This intermediate composite sheet is thereafter cut into blocks or tesserae which are applied to a backing in making the finished product embodying the final inlaid design.

When the present invention is used primarily to obtain novel design effects in the finished product the surface layer of each tesserae embodies a number of small sharply defined areas or design elements so that when assembled with other tesserae and incorporated in the finished product very unusual and characteristic designs are obtained with a minimum of labor and despite the large number of individual elements present in the design.

The surface layer may be made up of a plurality of pieces or strips of differently colored resinous or plastic material such as linoleum or the like arranged in any desired order, design or directions on the supporting layer to present a smooth continuous decorative surface having a straight-line inlaid design.

The supporting layer of the composite sheet may be of any desired thickness and may either be formed of material to which the surface layer may be permanently bonded during the formation of the composite sheet so as to become a permanent part of the tesserae into which the sheet is ultimately cut or may be formed of material which serves to form a permanent bond between the tesserae and a backing during the operation of forming a finished product. In the alternative the supporting layer may be removable from the surface layer so that the surface layer only is bonded to the backing in forming a finished product.

When the surface layer is permanently bonded to the supporting layer to produce thick laminated tesserae for use in the finished product the material of the supporting layer may be selected because of its strength, durability, resiliency, heat resisting or sound absorbing properties or because of its cheapness, its ability to adhere to a base in forming a finished product or because of other characteristics thereof. Such materials may be "scrap sheet" linoleum, resinous, cellulosic, asphaltic or rubber-like compositions and preferably is formed of thermo-plastic or thermo-setting material. When the supporting layer is to be removed from the surface layer before application of the surface layer to a base it may be formed of paper, cellulosic sheets, fabric or other material from which the surface layer is readily separated.

One of the objects of the present invention is to produce decorative material embodying blocks or tesserae each containing a straight-line inlaid design.

Another object of the invention is to produce laminated blocks or tesserae of any desired thickness for use in forming floor or wall covering material having straight-line inlaid designs.

Another object of the invention is to produce a novel type of composite sheet from which

blocks or tesserae may be cut for use in forming a finished product having a straight-line inlaid design.

A further object of the invention is to provide novel methods for producing blocks or tesserae for use in forming decorative material.

Another object of the invention is to provide novel apparatus adapted for use in forming decorative products.

These and other objects and features of the invention will appear from the following description thereof in which reference is made to the figures of the accompanying drawings which illustrate representative products, methods and apparatus embodying the present invention.

In the drawings:

Fig. 1 is a diagrammatic side elevation of typical mechanism embodying the present invention.

Fig. 2 is a diagrammatic plan view of the apparatus illustrated in Fig. 1.

Fig. 3 is a diagrammatic perspective of typical piece forming means adapted for use in preparing material for application by the mechanism of Figs. 1 and 2.

Fig. 4 is a plan view of a typical sheet of material produced in accordance with the present invention.

Fig. 5 is a vertical sectional view of the sheet illustrated in Fig. 4.

Fig. 6 is a fragmentary plan view of a decorative material embodying design elements formed from the sheet illustrated in Fig. 4, and

Figs. 7 and 8 are perspective of portions of alternative sheets produced in accordance with the present invention.

In the preferred embodiment of the invention herein described strips, pieces or similar design forming elements are produced by suitably cutting, stamping or molding the elements so that they are given a predetermined shape and are capable of arrangement in any desired order or preliminary design prior to their application to a supporting sheet. Any preferred mechanism may be used for this purpose such as that shown in Fig. 3 which is designed to produce strips of linoleum composition or the like, from which a preliminary straight line inlaid design may be developed. In this construction a sheet of uncured linoleum composition indicated at 3 is passed to rotatable slitting knives 5 and the resulting strips 20 of linoleum are wound upon reels 18. In the preferred operation strips of paper, Cellophane or other separating material 7 are passed from the rolls 9 to the reels 18 so as to space the convolutions of the strips 20 of linoleum from one another in the reel. In this way the material is kept from sticking together and the paper may be used to advance the strips and relieve the tension on the uncured linoleum so as to avoid breaking the strips. The strips thus formed may be of one color or have one appearance whereas other strips may be produced which have a different color or appearance. Thereafter, the differently colored strips may be suitably arranged in the desired order or sequence to produce a composite sheet embodying a predetermined preliminary design of a straight-line inlaid type.

In the practice of the present invention the composite sheet from which the blocks or tesserae are to be cut is preferably formed on apparatus of the type illustrated in Figs. 1 and 2 of the drawings. In this apparatus there is a base 2 over which a conveyor 4 is passed beneath successive strip or piece applying devices indicated at 6 and 8. The material which is to form the supporting layer 10 of the composite sheet is supplied from a roll 12 from which it passes to the conveyor 4. As indicated above the layer 10 may be formed of thermo-plastic material to which the decorative surface layer may be permanently bonded or it may be formed of material such as paper or a cellulosic sheet designed to be stripped from the back of the surface layer prior to application thereof to a base in forming the finished product. A preferred thermo-plastic material for this purpose is "scrap sheet" linoleum, the layers of which are separated in the roll 12 by a sheet of fabric or paper 14 which is drawn from the roll as it is unwound.

It is preferable to apply adhesive to the upper surface of the supporting sheet and therefore a device indicated at 16 is located adjacent the receiving end of the conveyor 4. The adhesive coated supporting layer carried by the conveyor then passes on beneath the strip or piece applying devices 6 and 8. These devices may be of any type adapted to locate the pieces or strips of surfacing material in predetermined locations on the supporting layer. As illustrated each device is provided with a number of reels 18 upon which are wound the previously formed strips of linoleum, thermo-plastic material or other material 20 for forming the decorative surface layer of the composite sheet. These reels are arranged to produce the desired preliminary design and to that end may be readily shifted from one position to another to vary the design at will. These strips pass in a controlled loop indicated at 22 from the reels 18 to strip aligning or positioning elements 24 which serve to locate the strips accurately with respect to the supporting layer of material passing beneath the same. The paper or other separating material 7 is drawn from the strip by the rolls 23 which serve also to advance the strip without applying appreciable tension thereto so that breaking of the strip is avoided.

In this way the first applying device 6 serves to arrange a number of strips or pieces 25 of surface forming material in predetermined spaced relation upon the surface of the supporting layer so that they are accurately located thereon. Pressure applying means such as a small roller 26 presses the strips or pieces of surface forming material against adhesive on the upper face of the supporting layer as they are deposited thereon so that they adhere to and are held accurately in place on the supporting layer. Thereafter as the supporting layer carrying the arranged design elements 25 moves on beneath the next applying device 8 additional strips or pieces of material 27 are applied to the supporting layer in the blank spaces between those strips or pieces applied by the device 6. Only two applying devices are shown but the number and arrangement of these devices are such as to cause the material forming the surface layer to cover substantially the entire upper face of the supporting layer.

These strips or pieces preferably are located so that their adjacent edges abut each other without overlapping and thus present a substantially smooth continuous upper surface having a straight-line inlaid design. This is easily effected in those constructions wherein straight parallel strips are applied so as to extend longitudinally of the supporting layer as it passes through the machine but when the devices are moved transversely of the base 2 and conveyor 4 to apply

the surface forming material in parallel but diagonally or sinuously extending strips on the supporting layer the movement of the applying devices must be coordinated so as to prevent overlapping of the strips as they are applied. Similarly when the material applied is in the form of separate pieces or strips having irregular edges the speed of the conveyor and manner of operation of the successive applying devices must be synchronized by suitable means to insure proper placement of the edges of the pieces so that they are in contact with each other but do not overlap.

As the conveyor moves on beyond the last applying device it carries with it the supporting layer of material with the overlying pieces or strips of the surface layer arranged thereon to cover its upper surface. The composite sheet thus formed is then subjected to heat and pressure by the heated press rolls **28** which serve to form a permanent bond between the edges of the strips which make up the decorative surface layer and, when the supporting layer is also formed with thermo-plastic material, this roll serves further to form a permanent bond between the surface layer and the supporting layer. Thereafter the finished composite sheet passes off of the conveyor and may be wound upon a roll for storage or it may pass directly to apparatus for cutting the desired blocks or tesserae therefrom.

A typical composite sheet produced as described above is illustrated in Figs. 4 and 5. This sheet embodies a preliminary design formed with alternate parallel stripes **25** and **27** of contrasting color which extend lengthwise of the sheet covering the supporting layer **10** and having their edges bonded to each other so as to present a smooth continuous decorative surface. The surface layer also adheres to the supporting layer of material and when the latter is formed of thermo-plastic material the surface layer is permanently bonded thereto.

The sheet illustrated in Fig. 4 may be cut into blocks or tesserae the edges of which extend transversely of the stripes in the sheet to form blocks as shown at **30** or to form marginal strips as shown at **32**, each of which embodies a number of design elements having sharply defined areas of different color arranged in a predetermined manner within the tesserae. These blocks and strips each embody a plurality of design elements and may be assembled with other blocks or tesserae as shown in Fig. 6 to obtain novel final design effects. The blocks or tesserae are assembled and secured to a backing in any conventional manner to provide a finished product. Very striking and unusual straight-line inlaid designs can be produced in this way by very simple operations and yet the design in the finished product is made up of a much greater number of design elements than has been possible heretofore when using simple methods for assembling the tesserae in the finished product.

When the strip applying devices **6** and **8** of the apparatus illustrated in Figs. 1 and 2 are moved transversely of the sheet to form diagonal or sinuous parallel stripes in the intermediate composite sheet the sheet may be cut as desired to form tesserae such as that illustrated in Fig. 7 wherein the design elements **33** are curved or otherwise arranged to depart from the rectangular effect obtained when employing an intermediate sheet of the type illustrated in Fig. 4.

As illustrated in Fig. 8 strips of material having irregular edges such as the strips indicated at **36, 38, 40** may be applied to the supporting layer so that the composite sheet itself has a rather complicated design thereon. With such a sheet it is possible to produce tesserae in which the strips or pieces of material are of irregular form and tesserae embodying a great number of different designs may be obtained from a single sheet by simply cutting the sheet into blocks or tesserae displaced or oriented from each other in the sheet as represented by the tesserae indicated at **34, 36, 38** and **40** in Fig. 8. In this way a single intermediate sheet may be used to produce a large number of contrasting tesserae which when embodied in the finished product serve to impart novel and unusual design effects to the finished product while the cost of producing such novel decorative material is very materially reduced.

The tesserae formed from the intermediate sheet may be assembled with other tesserae and secured to a suitable backing to produce a finished product when employing any of the conventional methods now used in producing inlaid linoleum and similar products. However, the thickness of the tessarae when laminated in accordance with the present invention may be considerably greater than that of the tesserae frequently used when forming inlaid linoleum and the supporting layer of laminated tesserae may be selected to impart to the finished product desired characteristics such as improved resiliency or durability, sound absorbing or fire resisting properties or other characteristics desired in the finished product. Thus for example, the supporting layer may be two or three times as thick as the surface layer and formed of resilient material such as thick "scrap sheet", resinous compositions, rubber or other material to which the surface layer may be permanently bonded and which may be secured to a suitable backing or base material to form a finished product.

When the supporting layer of material in the composite sheet is formed of paper, cellulosic material or the like, the material may be stripped from the decorative layer either before or after the composite sheet has been cut into blocks or tesserae. The remaining characteristically designed surface layer embodying strips or pieces of surface forming material secured together at their edges, may be applied to the backing in the form of blocks or tesserae as in conventional methods of forming inlaid linoleum and similar products.

While the invention has been illustrated in the drawings and described above with particular reference to the manufacture of floor coverings formed of linoleum or similar thermo-plastic material it will be apparent that wall covering materials and similar decorative products for other uses may be formed in accordance with the present invention.

These and other modifications and changes may be made in the type of apparatus employed and in the method of producing and using the intermediate composite sheet for forming decorative products. In view thereof it should be understood that the embodiments of the invention illustrated in the drawings and described herein are intended to be illustrative of the present invention and are not intended to limit the scope thereof.

I claim:

1. Floor covering or the like comprising a layer of backing material having secured thereto a plurality of blocks or tesserae each of which embodies a layer of thermo-plastic supporting material

that is continuous throughout the block and located adjacent the backing material and has the upper surface thereof completely covered by a single layer of decorative material embodying a plurality of differently colored individual, cut pieces of thermo-plastic material which are complementary in shape and arranged in predetermined position in the block and side by side in said layer so as to have abutting sharply defined cut edges bonded together and presenting a straight-line inlaid design.

2. Floor covering or the like comprising a layer of backing material having secured thereto a plurality of blocks or tesserae each of which embodies a layer of thermo-plastic supporting material that is continuous throughout the block located adjacent the backing material and has the upper surface thereof completely covered by a single layer of decorative material embodying a plurality of differently colored individual, cut pieces of linoleum which are complementary in shape and arranged in predetermined position in the block and side by side in said layer so as to have abutting sharply defined cut edges bonded together and presenting a straight-line inlaid design.

3. Floor covering or the like comprising a layer of backing material having secured thereto a plurality of blocks or tesserae each of which embodies a layer of linoleum supporting material that is continuous throughout the block and located adjacent the backing material and has the upper surface thereof completely covered by a single layer of decorative material embodying a plurality of differently colored individual, cut pieces of thermo-plastic material which are complementary in shape and arranged in predetermined position in the block and side by side in said layer so as to have abutting sharply defined cut edges bonded together and presenting a straight-line inlaid design.

4. Floor covering or the like comprising a layer of backing material having secured thereto a plurality of blocks or tesserae each of which embodies a layer of linoleum supporting material that is continuous throughout the block and located adjacent the backing material and has the upper surface thereof completely covered by a single layer of decorative material embodying a plurality of differently colored individual, cut pieces of linoleum which are complementary in shape and arranged in predetermined position in the block and side by side in said layer so as to have abutting sharply defined cut edges bonded together and presenting a straight-line inlaid design.

5. A method of producing inlaid linoleum products embodying a predetermined design which comprises the steps of sheeting uncured linoleum, cutting other and differently colored uncured linoleum into pieces having predetermined and complementary shapes, assembling said pieces on one face of the sheeted linoleum in edge to edge relation to substantially cover said face, subjecting the assembled pieces and sheeted linoleum to pressure to bond the pieces to each other and to the sheeted linoleum, severing the resulting pressed product into blocks or tessarae each embodying at least a portion of a plurality of said pieces, arranging said blocks or tesserae with other blocks or tesserae upon a layer of backing material with the edges of the blocks in contact and with the sheeted linoleum adjacent the backing, and subjecting the assembled blocks and backing to pressure to bond the blocks to each other and to said backing.

6. A method of producing inlaid linoleum products embodying a predetermined finished design which comprises the steps of sheeting uncured linoleum, cutting additional uncured linoleum into pieces having predetermined and complementary shapes, assembling said pieces on one face of the sheeted linoleum in edge to edge relation to substantially cover said face, subjecting the assembled pieces and sheeted linoleum to pressure to bond the pieces to each other and to the sheeted linoleum, severing the resulting pressed product into blocks or tesserae each embodying at least a portion of a plurality of said pieces, arranging said blocks on a layer of backing material with the sheeted linoleum adjacent the backing, applying further uncured linoleum to said backing adjacent said blocks, and subjecting the whole assembly to pressure to bond the blocks and further linoleum to each other and to said backing.

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