

Feb. 13, 1951

M. BUXBAUM ET AL

2,541,497

WRITING BOARD

Filed July 28, 1950

2 Sheets-Sheet 1

Fig. 1.

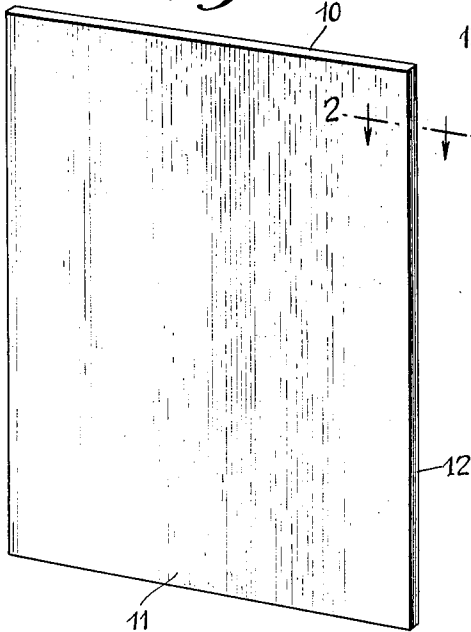


Fig. 3.

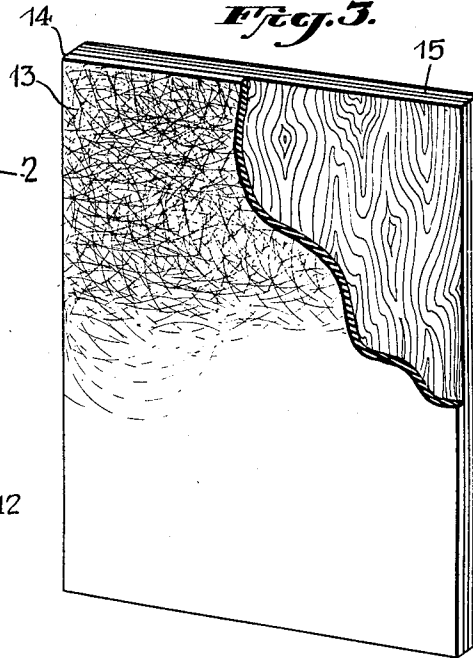


Fig. 4.

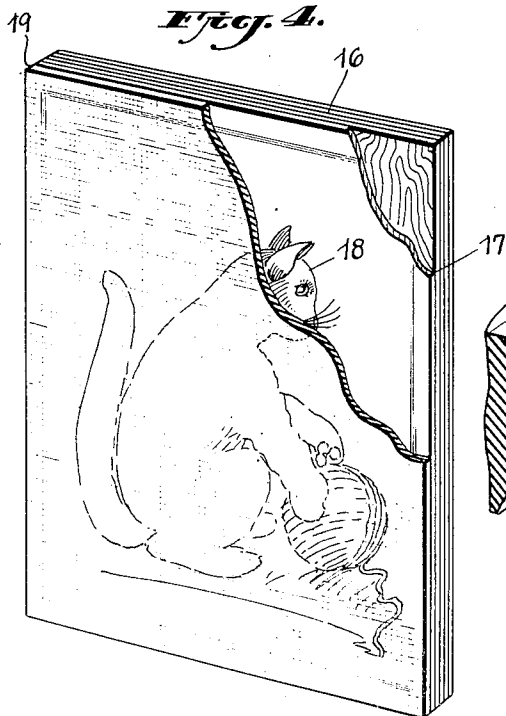
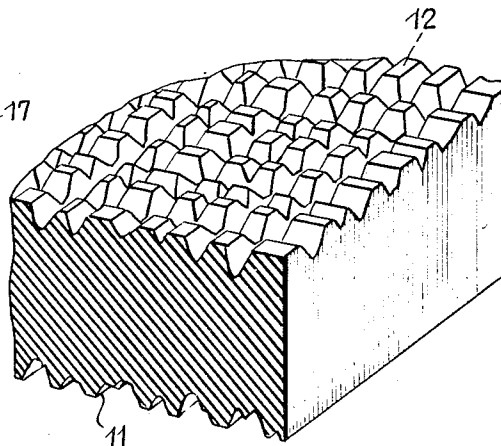


Fig. 2.



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2 Sheets-Sheet 2

Fig. 5.

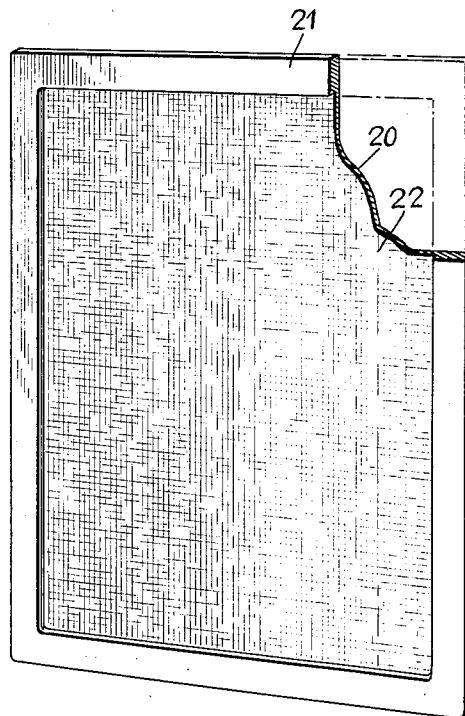
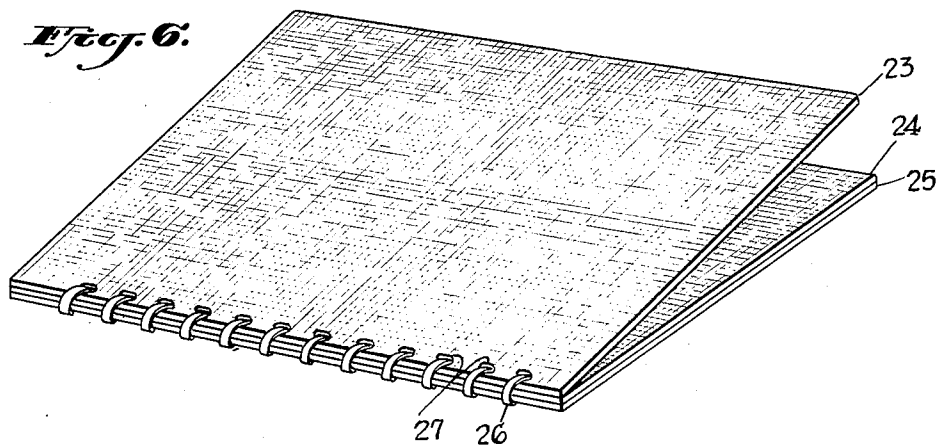


Fig. 6.



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UNITED STATES PATENT OFFICE

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WRITING BOARD

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3 Claims. (Cl. 35—66)

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This invention pertains to writing or marking boards made of synthetic resinous materials or compositions, and which are adapted for marking or writing thereon with chalk crayons or similar marking material.

Chalk is a friable material which has little, if any, adhesiveness, and in order for chalk crayons to produce a legible mark on a writing surface, the surface must be abrasive and have pockets or projections which will hold the chalk once the chalk has been removed from the crayon. Slate which is commonly used as a writing board or blackboard has a naturally abrasive surface composed of pits with jagged edges, but slate is not completely satisfactory as a writing board because it is heavy, is difficult to work and cannot readily be made in various colors. Furthermore, slate is comparatively expensive and may be fractured easily.

Composition writing boards for use with chalk crayons have heretofore been constructed which do not have the above-mentioned objectionable features of slate, but on the other hand, these boards have not been as satisfactory as slate in other respects. For example, the boards are not impervious to moisture so that after a number of washings to remove all traces of chalk, their surfaces peel, do not dry quickly and/or become pale or smooth and the boards themselves may warp. In addition, the colored surface on such boards is usually very thin so that after a relatively short period of use, the writing surface wears away exposing a backer of differently colored material or material which is unsuitable for chalk crayon writing purposes.

Both slate and the known types of composition boards may be stained by such materials as paint, grease, etc., and with some types of composition, it is difficult, if not impossible, to remove undesired substances, such as wax, gum, etc., from the surface of the writing board by the use of suitable solvents without damaging the writing surface.

A writing board should also be relatively hard and rigid to withstand the pressures applied during the writing processes and to provide a steady surface which will produce sharp, clean lines without marring. Slate is inherently hard and is sufficiently rigid in ordinary sizes, especially in the thicknesses usually required, to prevent fracture of the slate board during handling. However, not all composition boards are satisfactory in these respects.

It is an object of this invention to provide a chalk writing board which is light in weight,

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simple and inexpensive to manufacture and which is an improvement over the writing boards of the prior art.

Although it is known to manufacture sheets or plates of resinous materials, composed of or containing thermoplastic or thermosetting synthetic resin, such sheets or plates, as conventionally produced, are not suitable for marking or writing thereon with a chalk crayon, or the like, by reason of their high gloss surface finish, resulting from the highly polished tooled steel and often chromium plated molds, glass plates, or the like, employed for molding the same. Even when such molds are provided with a stipple or grooved surface for imparting a contour and decorative effect to the surface of the molded resinous article, the resulting surface of the article is likewise not suitable for marking or writing with chalk, crayon, or the like, thereon because it does not have sufficient abrading effect.

In accordance with the present invention, we propose to make writing or marking boards of synthetic resinous materials or compositions incorporating the same, by molding the same into sheets, plates or the like, and thereupon subjecting a surface or surfaces of these sheets or plates to a sanding, sand blasting, machining or engraving operation, thereby to roughen the surface into the form of myriads of small jagged abrading projections, which we have discovered are ideally adapted to abrading chalk crayons and similar materials, for marking or writing purposes.

For making up these writing sheets or plates, we may employ any of the well known thermoplastic or thermosetting resins, which may be employed as such, or in conjunction with suitable filler materials for molding purposes, or, in the case of the thermosetting resins, may be made up into the form of laminated plastic sheets or plates.

Thus, for the thermoplastic resins, we may employ any of the vinyl resins which are polymerizable into hard relatively rigid state, or polystyrene or the methacrylate resins. For the thermosetting resins, we may employ any of the phenol-aldehyde, phenol-melamine or urea-aldehyde resins, and the like, which may be employed in the form of molding compositions in finely comminuted form, alone or in admixture with such filler materials as wood flour, powdered mineral oxides, talc, etc.

Preferably, however, we make our writing boards of laminated plastic materials consisting of superimposed sheets of paper, cotton cloth

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or mat, or glass fiber cloth or mat, etc., impregnated with and consolidated under combined heat and pressure by a thermosetting synthetic resin of the character aforesaid.

The above-described sheets or plates are strong, rigid and self-supporting, even though they may be relatively thin. Hence, they may be used as writing boards without further modification but they may also be surrounded by frames, either fastened thereto or integral therewith or they may be mounted on a backing material, such as wood, pressed board, sheets or panels of other resinous materials, etc. Furthermore, such sheets or plates are light in weight, long lasting, easy to work and impervious to moisture and other liquids and may be made in a variety of colors.

The various objects and advantages of the invention and the invention itself may be better understood by reference to the following detailed description of specific embodiments, given by way of example only, in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of a resinous sheet or plate prepared in accordance with our invention;

Fig. 2 is a greatly enlarged fragmentary perspective view of the sheet or plate shown in Fig. 1 and taken along the line 2-2 indicated in Fig. 1;

Fig. 3 is a perspective view, partly in section, showing a resinous sheet prepared in accordance with our invention and applied to a backer;

Fig. 4 is a perspective view, partly in section, of a composite writing board prepared in accordance with our invention;

Fig. 5 is a perspective view, partly in section, of a writing board prepared in accordance with our invention and having a frame integral therewith; and

Fig. 6 is a perspective view of a plurality of plates prepared and assembled in accordance with our invention.

In Fig. 1, there is shown a sheet or plate 10 having a front surface 11 and a back surface 12. The plate which may have any desired shape or size and which may have any desired color is relatively rigid and self-supporting and may be used as a writing board without further modification.

The plate 10 may be prepared in any one of several ways. For example, the plate may be prepared by molding under heat and pressure in a known manner any of the well known types of resins which after molding and at room temperature have relatively hard surfaces. The resins may, for example, be a vinyl resin which is polymerizable, polystyrene or methacrylate resin. Alternatively, the resin may be a thermosetting resin of the phenol-aldehyde, phenol-melamine or urea-aldehyde type. The resins may be employed in the form of molding compositions in a finely comminuted form, alone or in admixture with such filler materials as wood flour, powdered mineral oxides, talc, etc.

In the preferred form of the invention, the plate 10 is made by impregnating sheets of fibrous material, such as paper, cloth, etc., with a thermosetting resin and by subsequently consolidating the sheets and the resin by applying heat and pressure to the laminated structure. In this form, the plate is relatively rigid, although it may be very thin and it is substantially unaffected by temperature.

After the plate has been prepared by one of

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the above methods, one or both of the surfaces is roughened by sanding, sand blasting, machining or engraving. The roughening process is of such a nature that the glossy finish which is obtained during the molding process is not only dulled but also the surface of the plate is covered with fine scratches. These scratches may or may not be visible to the naked eye and in the preferred form of the invention, the scratches are so fine and so distributed that the surface of the plate appears to be substantially continuous. However, the depth and size of the scratches should be sufficient to abrade and hold chalk from a crayon when it is drawn across the surface of the plate in a normal manner, i. e., gently but firmly. We have found, for example, that when the surface is sanded, a paper of roughness equal to grade 8-0 flint paper or coarser should be employed and preferably the paper should have a roughness in the range from grade 2-0 to grade 1.

When the surface of the plate 10 is roughened by sanding, the sanding may be carried out in only a single direction across the surface of the plate, producing scratches and hence a series of projections on the surface which are substantially unidirectional, as illustrated on the surface 11 in Fig. 1. When the projections are substantially unidirectional, a chalk crayon drawn across the surface in a direction perpendicular to the scratches tends to produce a better defined mark than when the chalk crayon is drawn across the surface in another direction, such as in the direction of scratching, for example. Therefore, it is preferable that the scratching of the surface be carried out in at least two directions. These two directions may be mutually perpendicular, for example, but they may have other angles of intersection and they may be parallel or at angles to the edges of the plate.

The greatly enlarged section shown in Fig. 2 illustrates the types of surfaces which are produced on the plate when it is subjected to sanding in the manner indicated above. The top surface 12 shown in Fig. 2 illustrates the type of surface which is obtained when the plate is sanded in two mutually perpendicular directions, and the bottom surface 11 illustrates the type of surface obtained when the plate is sanded in one direction only. It will be noted that the surface 12 comprises a plurality of projections generally extending in substantially mutually perpendicular directions and the projections are of irregular shape and size. The surfaces shown in Fig. 2 illustrate only approximately the arrangement of projections which is obtained when the plate 10 is sanded, and the height of the projections is exaggerated with respect to the thickness of the plate 10 normally employed for a writing board.

If instead of substantially unidirectional projections, projections extending in a plurality of directions are desired, the surface of the panel 10 may be sanded by a circular sanding disc which will produce approximately circular scratches of the type indicated on the surface 13 in Fig. 3. The scratches overlap so that the entire surface 13 is almost continuously covered by projections which will abrade and hold chalk.

As mentioned above in connection with Fig. 1, the plate 10 may be of a thickness sufficient to be self-supporting and to be used without further supporting structure as a writing board, but in a preferred form of the invention, the plate of resinous material is made relatively thin and

opaque and is applied to a relatively rigid backer of a material, such as wood, pressed board, plates of different resinous material, or superimposed layers of wood bonded to each other etc. In Fig. 3, we have shown a sheet or plate 14 cemented or otherwise fastened to the surface of a backer 15 made of wood. The surface 13 of the sheet 14 may be roughened in the manner heretofore described either before or after it is fastened to the surface of the backer 15.

Some of the resins which are suitable for use in constructing the writing board of our invention, such as methacrylate, polystyrene and some of the phenolics, can be processed so that they are transparent in the hardened state. Accordingly, it is possible to apply a sheet of hard, transparent resinous material to a sheet of material on which appear figures of various sorts, and to trace the figure on the resin sheet with chalk. In Fig. 4, we have shown a form of the invention, in which the transparent characteristics of the above-mentioned types of resinous materials are used to permit the construction of a novel writing board. The writing board shown in Fig. 4 comprises a backer 16 of relatively rigid material, such as wood, to which is cemented or otherwise fastened a sheet of material 17, such as paper. A figure 18 may be outlined in opaque marks on the front surface of the sheet 17 as by drawing, printing, lithographing, etc., and a sheet 19 of transparent resinous material is cemented on top of the sheet 17, with a clear or transparent cement. Preferably, the exposed surface of the sheet 19 is roughened by producing scratches on the surface in two mutually perpendicular directions, and the surface may be scratched either before or after applying the sheet 19 to the sheet 17. In roughening the surface of the sheet 19, care should be taken to scratch the surface only lightly so that the figure 18 will not be distorted or obscured when viewed through the sheet 19.

If it is desirable to use a relatively thin sheet of resinous material for the writing portion of the board and if it is considered undesirable to attach the sheet to a backer of relatively rigid material, the writing board may be constructed in the form shown in Fig. 5. In this figure, a relatively thin sheet 20 of resinous material is surrounded by a frame 21 of resinous material formed integrally with the sheet 20. The board may be made by treating or forming the resinous material in a mold having the configuration of the board shown in Fig. 5, or if desired, it may be formed by building up the sheet 20 with a plurality of resin impregnated sheets of fibrous material, superimposing on these sheets a plurality of resin impregnated strips of fibrous material having the configuration of the frame 21 and subsequently subjecting the assembly to heat and pressure in a mold having a suitable shape. If desired, the sheets forming the portion 20 of the board may be impregnated with a resin having a color different from the resin used to impregnate the strips so that the completed board will have a writing surface of one color and a frame of another color. After the board has been formed, the surface 22 of the sheet 20 is roughened in any of the manners heretofore described.

Because the plates of the present invention may be relatively thin and light, they may be assembled in book form, as indicated in Fig. 6. The pages 23, 24 and 25 of the book shown in Fig.

6 may be made in the same manner as the plate 10 shown in Fig. 1, and they may be roughened on one or both sides. The plates may be held together by means of a spiral strip 26 which extends through apertures 27 near the edges of the plates, and they may be differently colored so as to be complementary in color to the colors of the chalk used for writing thereon.

If the book shown in Fig. 6 is intended solely for chalk use, both sides of each sheet 23, 24 and 25 would preferably be roughened. It is possible, however, to use the sheets for both chalk and wax crayon writing by roughening one side of a sheet only and by leaving the opposite side of the sheet in the glossy condition obtained after molding. The glossy surface, although not suitable for chalk writing, will readily receive wax crayon marks which may be removed by merely wiping the surface with a cloth.

While the principles of the invention have been described in connection with a specific form, it is to be understood that the description has been given by way of example only and other modifications thereof, which will be readily apparent to those skilled in the art, may be made without departing from the scope of the invention which is defined by the claims appended hereto.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A relatively stiff and rigid, laminated plastic writing board, comprising a plurality of superimposed sheets of fibrous material, impregnated with and consolidated by a thermostat synthetic resin, one surface of said board being minutely serrated for abrading and holding chalk, and the opposite surface of said board having bonded thereto a laminated backing consisting of superimposed layers of wood bonded to each other.

2. A writing board according to claim 1 wherein the abraded surface lamina of said laminate comprises a clear and transparent resin, and wherein the lamina disposed below said surface lamina has opaque markings thereon viewable through said abraded surface lamina.

3. A writing board according to claim 1 wherein said serrated surface is sand abraded.

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