United States Patent [19]

Fraser

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[54] **BLACKBOARD ERASER**

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[52] **U.S. Cl.** ..... **15/244 R**

[51] **Int. Cl.** **B43l 21/02**

[58] **Field of Search** ..... 15/118, 244 R, 244 B, 15/244 C, 244 CH

[56] **References Cited**

UNITED STATES PATENTS

3,262,145	7/1966	Carlson	15/244 R
2,249,912	7/1941	Oxley	15/244 CH X
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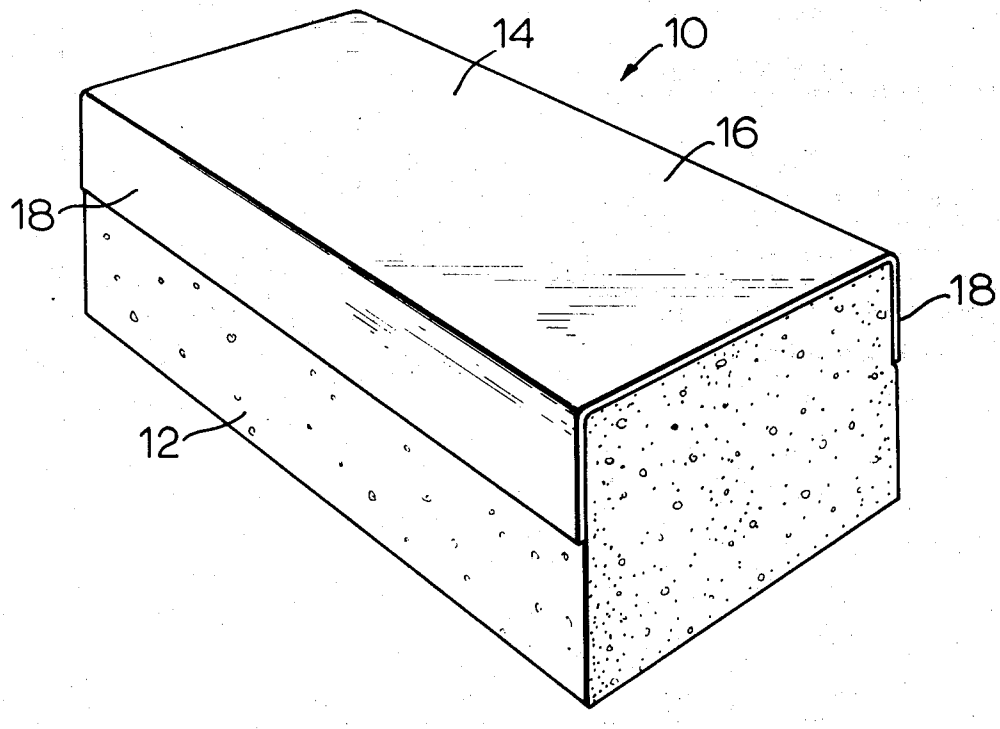
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[57] **ABSTRACT**

An eraser for removing chalk marks from blackboards, consisting of a block of non-reticulated, flexible, polyester urethane foam having inter-connected air cells and from about 70 to about 100 pores per linear inch, the block being supported by a channel-shaped holder.

5 Claims, 3 Drawing Figures



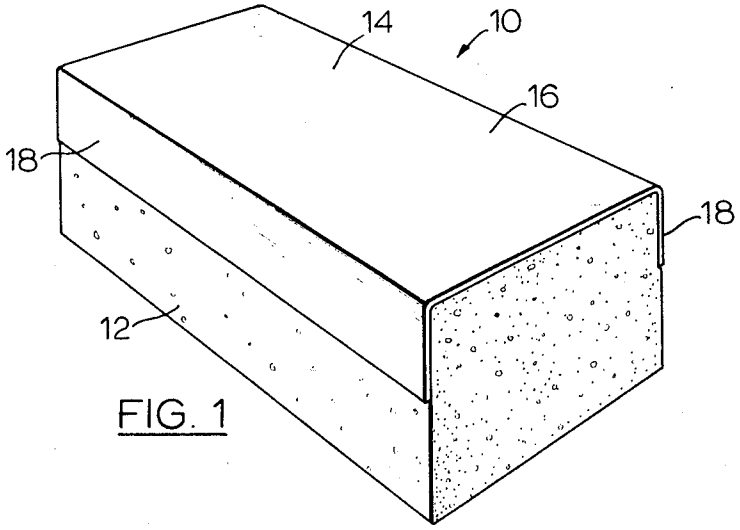


FIG. 1

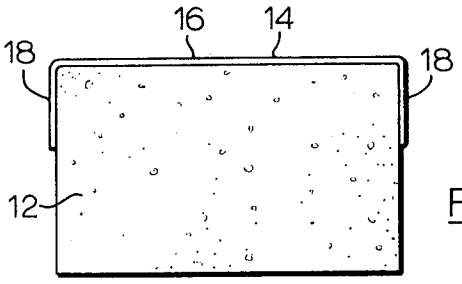


FIG. 2

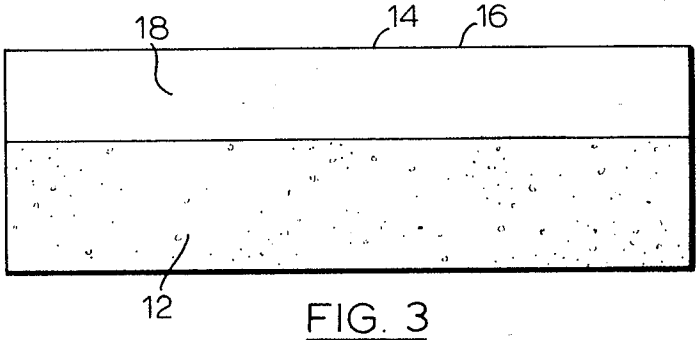


FIG. 3

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BLACKBOARD ERASER

This invention relates generally to blackboard erasers, and is intended for removing chalk marks from blackboards, whether these latter be of slate, composition or glass.

Although many different substances such as felt, partly sheared sheepskin, carpet and cloth, have been utilized to erase blackboards, these materials all have the rather serious drawback that because the chalk tends to accumulate on the surface of these erasers, it is not possible to remove all (or substantially all) of the chalk from the board. Thus, all of these substances have a tendency to leave a whitish mark on the board after only a few minutes of use due to the accumulation of chalk.

It has been proposed to utilize, for the purpose of erasing chalk marks from blackboards, rubber latex of cellular form, and in particular reference is made to U.S. Pat. No. 2,249,912, "Blackboard Eraser" issued July 2, 1941 to John H. Oxley. Oxley, in his patent, describes the provision of an elongated block of cellular latex which is compressible, elastic and resilient and resembles sponge rubber, although differing therefrom by virtue of containing inter-connected air cells. According to Oxley, this particular product is made by beating air into liquid latex until it acquires a foamy consistency, and then water-curing the material.

In his patent, Oxley admits that although his cellular latex material removes chalk dust more effectively than the other materials listed above, it does not entirely remove all chalk dust, so that at the end of a day's use a thorough cleaning is required. Oxley then discusses the provision of another feature of his eraser which is intended to provide this final cleaning.

The object of the present invention is to overcome not only the inherent disadvantages of the prior art materials used for erasing chalk marks from blackboards, but to improve upon the device taught by Oxley in his U.S. Pat. No. 2,249,912 in such a way that no final cleaning is required at the end of a day's use, and that the blackboard eraser provided herein can be used for several days in succession without cleaning.

The focus of this invention lies in the recognition that certain inherent properties of Oxley's cellular latex material render it something less than ideal for achieving the objects he sets out to attain. In the first place, latex material, being essentially rubber, does not have the kind of cross-polymerization bonding between the long-chain molecules which would give it sufficient strength to withstand the constant abrasion and tearing action arising from the friction of the eraser against the blackboard. As is well known, many blackboard materials are rather rough in surface texture, and of course the rougher the surface texture of the blackboard the greater is the tendency to wear and abrade the eraser material.

Secondly, it is extremely difficult to obtain satisfactory cell disposition in the latex whereby all cells are interconnected. It is sometimes possible to obtain a large portion of inter-connected air cells when the cells are sufficiently large in the latex, but as the cells decrease in size it becomes progressively more difficult to achieve what is called a non-reticulated structure. The difficulty encountered by Oxley in his use of latex is that it is absolutely essential that the interconnected air cells in the foam structure be smaller than a given critical size due to the very minute dimensions of the chalk dust. If the inter-connected air cells are larger than this critical size, they simply will not retain the chalk dust, and the eraser will end up leaving as much chalk on the board as it takes off, not to mention the requirement for daily or hourly cleaning of the eraser.

It is thus an object of this invention to provide a chalk eraser which incorporates a foamed material the properties of which are such that it is capable of withstanding a very high degree of abrasion without rupture or tearing, and such that it is capable, due to its very small cells which are virtually 100 percent inter-connected, of absorbing and retaining chalk dust for a considerable period of time.

The material I have discovered to be ideal for the purpose of removing chalk marks from a blackboard, whether of slate composition or glass, is non-reticulated, flexible, polyester urethane foam having inter-connected cells and from about 70 to about 100 pores per linear inch.

The most satisfactory material of this kind that I have thus far been able to discover is known as Scott Special-Pore Custom Foam, has approximately 80 pores per linear inch, and weighs approximately two pounds per cubic foot. This material is distributed by the Scott Paper Company of Chester, Pennsylvania, and is itself the subject of certain patents and/or applications. Naturally, I make no claim to the material per se, but only to its specific application in the field of chalk erasers.

It has been found that, unlike the cellular latex described by Oxley in his U.S. Pat. No. 2,249,912, a blackboard eraser manufactured in accordance with the present invention using a block of non-reticulated, flexible, polyester urethane foam having inter-connected cells and from about **70** to about **100** pores per linear inch is capable of repeated use for several days in succession without requiring cleaning, and will continuously absorb chalk dust until the block of polyester urethane foam becomes completely saturated with the chalk dust. The eraser may then be beaten out or washed to remove the accumulated chalk dust.

One embodiment of this invention is shown in the accompanying drawings, in which like numerals denote like parts throughout the several views, and in which:

FIG. **1** is a perspective view of an eraser constructed in accordance with this invention;

FIG. **2** is an end view of the eraser shown in FIG. **1**; and

FIG. **3** is a side view of the eraser shown in FIG. **1**.

In the Figures, an eraser **10** is shown to comprise an elongated block **12** of non-reticulated, flexible, polyester urethane foam having inter-connected cells and from about 70 to about 100 pores per linear inch, and a channel-shaped holder **14** which includes an upper wall **16**, and two depending side walls **18** within which the block **12** is fixed, preferably with glue. As can be seen particularly in FIG. **2**, it is preferable that the elongated block **12** of polyester urethane foam have a rectangular cross-section of which the width is approximately twice the breadth, with the channel-shaped holder **14** spanning the width and the depending side walls **18** reaching part-way down the depth of the block **12**.

In practice, it has been found preferable that the depth of the block (i.e. its dimension measured perpendicularly to the upper wall **16**) lie between 1½ inches and 2 inches, because this enables the block to absorb

and retain sufficient chalk that cleaning is required only at fairly long intervals. With a depth of this order, the eraser can undergo normal daily use for several days before necessitating cleaning.

Naturally, the block **12** of polyester urethane foam may have other shapes as desired, and in particular it has been found to be of advantage to increase the elongation of the block **12** to provide an eraser of which the length is of the order of 2 feet. This has not been possible heretofore, because of the necessity to apply considerable pressure at right-angles to the blackboard in order to remove all of the chalk. With the polyester urethane foam described in this application, however, the necessary pressure against the blackboard to achieve completely satisfactory cleaning is considerably reduced, and thus it is possible to increase the length of the eraser **10** so that a much larger area may be cleaned with each sweep.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A chalk eraser comprising an elongated block of non-reticulated, flexible, polyester urethane foam having interconnected cells and from about 70 to about 100 pores per linear inch, and a channel-shaped holder of substantially rigid material including an upper wall and two depending side walls, the block of polyester urethane foam being fixed within the channel-shaped holder.

2. A chalk eraser as claimed in claim **1**, in which the said block has a rectangular cross-section of which the width is approximately twice the depth, the channel-shaped holder spanning the width and the depending side walls reaching part-way down the depth of the block.

3. A chalk eraser as claimed in claim **1**, in which the polyester urethane foam has between 75 and 85 pores per linear inch.

4. A chalk eraser as claimed in claim **1**, in which the block of polyester urethane foam is glued within the channel-shaped holder.

5. A chalk eraser as claimed in claim **2**, in which the depth of said block is between 1½ inches and 2 inches, thereby enabling the block to absorb and retain chalk from several day's use before necessitating cleaning.

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