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TITLE: METHOD FOR MANUFACTURING SOLUTION FOR HONEYCOMB
PLATE OF A MAGNETIC DRAWING BOARD

When a child is learning how to write or how to draw a picture, it is helpful for him to use a drawing board. A magnetic drawing board provides the advantage that the child can write or draw anything on it easily and also can erase it without any mess. A plate with a plurality of honeycomb units is disposed in the magnetic drawing board. The honeycomb units are filled with mineral oil, which is mixed with silicon dioxide, iron powder, etc., so that a word or a drawing which is written or drafted can be displayed on the panel of a magnetic drawing board. It is known conventionally that the magnetic drawing board includes a magnetic sliding rod beneath the honeycomb unit plate. When the sliding rod is moved under the honeycomb unit plate, the word or drawing displayed on the panel will disappear the iron powder sinks down. A drawing pen with a magnetic portion at its tip draws the iron powder up and accumulates on the surface of the plate so that a line, a word or a picture is formed. Since the iron powder sinks or rises in the mineral oil by magnetic force, the resistance to flow, or viscosity, of the oil can not be too great. Further, since the mineral oil has to be mixed with silicon dioxide and other components, it is not easy for manufacturing.

The primary objective of the present invention is

to provide a magnetic drawing board which has vegetable oil mixed with a relatively light colorant such as white dye and a relatively dark magnetic powder such as iron powder to be filled in the honeycomb units.

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Another objective of the present invention is to provide a method for manufacturing a solution to be filled in the honeycomb unit plate. The solution consists of vegetable oil, relatively light colorant e.g. white dye and relatively
10 dark magnetic powder e.g. iron powder and the proportion is about 500: about 1: about 10.

Reference is now made to the accompanying drawings, wherein:

15 Figure 1 is a perspective view of a magnetic drawing board in accordance with the present invention;

Figure 2 is an exploded view of the magnetic drawing board of Figure 1; and

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Figure 3 shows the processes in accordance with the present invention for manufacturing the solution to be filled in the honeycomb units of the magnetic drawing board.

25 Referring to Figures 1 and 2, it can be seen that a magnetic drawing board in accordance with the present invention comprises a base 1, a honeycomb unit plate 2 and a panel 3. the base 1 includes a cavity 11, a first channel 12 and a

second channel 13. In cavity 11, there is a sliding rod 4 disposed therein which can be slid transversely thereover. The sliding rod 4 is magnetic and has a handle 41 protruding out from the cavity 11. A pair of channels (first and second channels, respectively) 12, 13 are arranged proximate to the cavity 11. The first channel 12 has a plurality of slots 121, such as a triangular slot, a circular slot and a square slot. Each slot 121 receives a like-shaped member 6 which is used for drawing. A drawing pen 5 with a magnetic tip is located in the second channel 13. A honeycomb unit plate 2 is placed on top of the cavity 11. The honeycomb unit plate 2 has a plurality of honeycomb units 22, each of which is filled with some solution. This solution will be described hereinafter. A panel 3 is covered above the honeycomb unit plate 2 and engaged with the base 1. The above-mentioned structure is quite similar to conventional magnetic drawing boards. It is known that the conventional solution for filling honeycomb units consists of mineral oil which is mixed with silicon dioxide and other agents. However, the solution of the present invention is completely different from that of conventional magnetic drawing boards. Further, the manufacturing processes of the solution of the present application are also completely different from those of conventional magnetic drawing boards.

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Referring to Figure 3, it can be seen that the manufacturing processes of the solution in accordance with the present invention comprises the following steps:

- (1) Vegetable oil is mixed with white dye in the proportion of about 500: about 1 to form an intermediate solution of white color;
- (2) The intermediate solution is mixed with iron powder in the proportion of about 50: about 1 to form a final solution, such that the proportion of vegetable oil, white dye and iron powder is about 500: about 1: about 10;
- (3) The final solution is injected into honeycomb units of the honeycomb unit plate; and
- (4) The final solution is baked in the honeycomb units until a thin film forms on the surface of the final solution.

When drawing, the drawing pen 5 is swept or pressed on the upper surface of panel 3. The inherent magnetism of the drawing pen 5 interacts with the iron powder deposited on the bottom layer of the solution. The iron powder is induced to be magnetized. If the induced magnetic attraction force is strong enough to overcome the resistance against the movement of the iron powder caused by the viscosity of the solution, the iron powder can move freely through the solution and suspend thereon. Under normal conditions, without any disturbance, the powder will stagnate on the solution for a while. Because of the contrast between the black iron powder and the white dye, a

line, drawing or word is displayed according to the distribution of the iron powder. For cleaning the word or drawing displayed on the panel 3, pushing the sliding rod 4 slides beneath the honeycomb plate 2. The inherent magnetism within the sliding rod 4 interacts with the iron powder suspended on the top layer of the solution. Since the magnetic force of the sliding rod 4 is strong enough to overcome the viscosity of the solution, the iron powder is forced to deposit on the bottom layer of the solution. Therefore, the panel 3 is cleaned and retained in white. That is, the drawing or word "disappears". It is known conventionally that iron powder is suspendable in solution and can be made to sink or rise by magnetic force. Since the density and viscosity of mineral oil are greater than those of vegetable oil, the freedom of movement of the iron powder used in the present invention is greater than that of conventional magnetic drawing boards. Since the solution of the present invention does not have to be mixed with silicon dioxide or other agents, the manufacturing processes for the present invention are substantially reduced.

While the invention has been explained in relation to its preferred embodiment, it is to be understood that various modifications thereof will become apparent to those skilled in the art upon reading this specification. Therefore, it is to be understood that the invention disclosed herein is intended to cover such modifications as fall within the scope of the appended claims.



CLAIMS

1. A method for manufacturing a solution for honeycomb unit plates of a magnetic drawing board comprising a number of steps as follows:-

- 5 (a) mixing vegetable oil with a relatively light colorant such as white dye in a proportion of about 500: about 1 to form an intermediate solution having a relatively light color such as white;
- 10 (b) mixing said intermediate solution with a relatively dark magnetic powder such as iron powder in such a proportion as to form a final solution in which the respective proportions of vegetable oil, relatively light colorant such as white dye and relatively dark magnetic powder such as iron
- 15 powder are about 500: about 1: about 10;
- (c) injecting said final solution into honeycomb units of the honeycomb unit plate; and
- 20 (d) baking said solution in said honeycomb units so that a thin film is formed on a surface of the final solution.

2. A method for manufacturing a solution substantially as hereinbefore described with reference to and as shown in the

25 accompanying drawings.

3. A solution for use in honeycomb unit plates, whenever made by a method as claimed in Claim 1 or Claim 2.



4. A honeycomb unit plate for a magnetic drawing board, in which plate there is provided a solution comprising vegetable oil, relatively light colorant and relatively dark magnetic powder in proportions of about 500: about 1:
5 about 10.

5. A honeycomb unit plate according to claim 4 substantially as hereinbefore described.
