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MAGNETIC DISPLAY ARRANGEMENT

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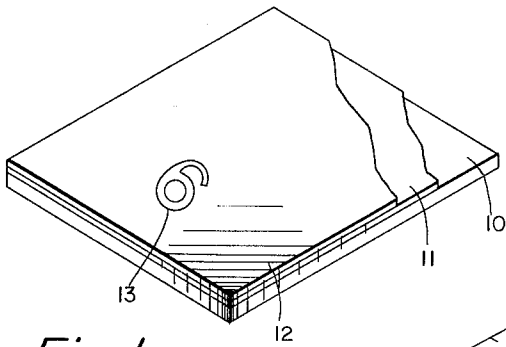


Fig. 1

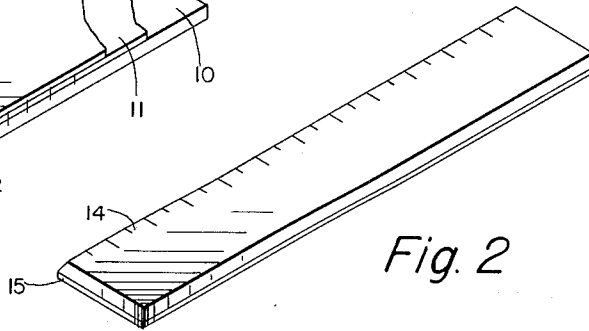


Fig. 2

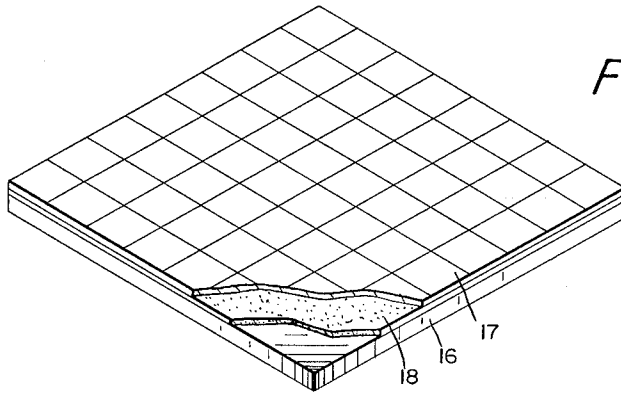


Fig. 3

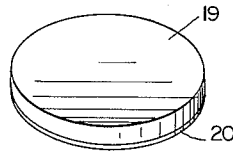


Fig. 4

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MAGNETIC DISPLAY ARRANGEMENT

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This invention relates to a unitary magnetic arrangement intended for visual use, such as for visual demonstration boards, displays, maps, charts, games and drawings.

In the past it has been proposed to provide visual demonstration boards, charts and the like which were of magnetizable material and which were intended to support smaller elements, such as markers. Such removable or changeable smaller elements were provided with magnets, or themselves constituted magnets, so that they were held on the demonstration board, chart or the like by magnetic attraction. Because of the wide variety of uses for such magnetic visual display arrangements, there must be a corresponding variety of different types of such removable or changeable markers or the like. As a consequence, the cost of many such installations tended to be excessively high. Another disadvantage with the previous arrangements of this general type was the impossibility of using removable or changeable elements, such as markers, which were of very thin material, which is necessary in some instances.

In accordance with the present invention, these difficulties are solved by a novel arrangement in which the supporting member itself is pre-magnetized so as to act as a magnet, while the markers or other removable or changeable objects are simply formed of magnetizable material, such as thin iron foil, for example. With this arrangement, the cost of such installations is materially reduced and the number and types of applications of such installations are broadened to include uses which previously were considered impractical or uneconomical.

It is an object of this invention to provide a novel improved arrangement in which a support, such as a demonstration board, chart or the like, holds a smaller removable or changeable member, such as a marker, by magnetic attraction.

It is also an object of this invention to provide a novel magnetic support which is flexible and may be rolled up when not in use.

It is a further object of this invention to provide a novel magnetic support which has a removable layer adapted to having visual markings thereon.

Additional novel aspects and advantages of this invention will be apparent from the following description of embodiments thereof, which are illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a perspective view, with parts broken away, of a magnetic visual display arrangement according to the present invention;

FIG. 2 is a perspective view of a ruler having a magnetizable layer on the bottom for cooperation with a magnetic board in accordance with the present invention;

FIGURE 3 is a perspective view, with parts broken away, of a magnetic base having a game board sheet removably attached thereto by means of a pressure sensitive adhesive in accordance with the present invention; and

FIGURE 4 is an enlarged perspective view of a game piece for use with the game board of FIG. 3.

Referring first to FIG. 1, the magnetic display arrangement according to the present invention includes a backing layer 10 composed in whole or part of pre-magnetized iron. This layer is magnetized to have a very powerful

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and, above all, uniform magnetic power field so that it may hold ferrous foils perfectly and may be a rigid board or it may be made flexible, for example, by embedding permanent magnetic iron powder in a rubber or plastic binder. Where the backing layer 10 is flexible, it may be rolled up when not in use. In either case, the backing layer 10 acts as a permanent magnet for holding magnetizable material by magnetic attraction.

Over one face of this backing layer is positioned a thin integral sheet composed of a magnetizable layer 11 and an overlying visual display layer 12 of non-magnetic material which may be written upon, printed, or colored. As shown in FIG. 1, in the final assembly the magnetizable layer 11 is positioned next to the magnetic backing layer 10 and is held thereon by magnetic attraction, while the overlying layer 12 is exposed to view.

The visible layer 12 may be in the form of varnish sprayed onto a soft iron foil 11, or gummed paper, a gummed or sprayed plastic, or the like.

Alternatively, the thin sheet composed of the layers 11 and 12 may be formed by depositing an iron-containing coating 11 on a non-metallic layer 12. In such event, the coating 11 may be in the form of iron powder stirred into a suitable binding material. The iron powder is homogeneously distributed in the binding material, which may be a suitable varnish or an adhesive, and which is applied to the non-metallic layer 12 by painting, spraying, sprinkling, or by a sieve printing machine. The non-metallic layer 12 desirably may be of paper or cardboard. A sheet constructed in this manner is less expensive than where the magnetizable layer is of iron foil. In addition, the sheet constructed in this manner is more flexible, is less likely to tear and does not have the sharp edges characteristic of sheets made with a foil layer.

In either case, the integral sheet composed of the contiguous layers 11, 12 is only a few hundredths of a millimeter thick and is flexible. The visible surface 12 of this sheet can be written upon, drawn upon or colored in any desired manner. For example, it can be inserted in a typewriter and the desired indicia typed thereon, or it can be written upon or drawn upon by hand, or it can be printed upon by any of the usual processes.

The visible, non-metallic layer 12 of this sheet may constitute a map, chart, or the like on which there are to be no markings made or on which markings are to be made by the usual techniques of drawing or writing thereon.

Alternatively, the visible layer 12 may serve as a base for receiving thin separate magnetizable markers or symbols, such as the numeral designated in FIG. 1 by the reference character 13. Such markers desirably may be made out of thin iron sheets of any desired thickness which are held on the visible layer 12 by means of the magnetic attraction exerted by the underlying magnetic layer 10 by exerting the uniform magnetic power field of the layer 10 through the magnetic layer 12.

In some instances, such small markers may be positioned directly on the underlying magnetic layer 10 without the necessity of having the overlying sheet 11, 12. In such event, the front face of the magnetic layer 10 may be suitably colored, for example by spraying on clear varnish or aluminum bronze. This expedient may be particularly useful when the magnetic layer 10 is in the form of a flexible sheet which is adapted to be rolled up and to serve as a wall map.

Either the visible layer 12 or the individual markers 13 may have a phosphorescent or luminous surface. If such a board assembly is illuminated with ultra-violet light, it gives a notably distinctive and effective appearance, especially if the board is in a room which lacks bright illumination. Such assemblies are especially well suited for

use as information boards in railway stations, bus stations or airports.

Also, in accordance with the present invention the layer 11 of the sheet 11, 12 may be pre-magnetized so as to itself constitute a magnet. In such case the base 10 would be unnecessary and the magnetic sheet 11, 12 would constitute a base for receiving magnetizable articles.

A further possible use for the present invention is as a drawing board. In such case, the drawing instruments, such as the ruler 14 in FIG. 2, are underlaid with a thin soft iron foil layer 15. With such an arrangement, such instruments are held magnetically by the magnetic board 10 so that an accidental displacement while drawing is effectively prevented.

FIG. 3 illustrates another novel aspect of the present invention as applied specifically to a game board, although it may be applied to other uses, if desired. Here the board comprises a magnetic base 16, which may be rigid or flexible, as desired. This magnetic base may consist of magnetic iron powder imbedded in a plastic, or it may be any other suitable magnetic body. This base is provided with a removable cover in the form of a sheet having a non-magnetic layer 17 on which the game markings are imprinted and a permanent adhesive layer 18, which desirably may be of the pressure sensitive type. The layer 17 which has the game markings thereon may be of thin plastic material to which the adhesive 18 adheres permanently, so that this cover may be applied to the magnetic base 16 by pressure and may be peeled off of the base when it is desired to position a different game sheet on the base.

Obviously, two such sheets may be provided, one for each major face of the base 16 so that it will be possible to change from one game to another simply by turning the game board over.

As shown in FIG. 4, each of the game pieces for use with the FIG. 3 game board may be a non-magnetic member 19 provided on the bottom with a thin magnetizable layer 20. This may be done by painting or spraying onto the bottom of a conventional game piece a varnish containing powdered iron. Because of the strong magnetic field of the base 16 it will attract and hold such pieces, even the larger game pieces, such as chess pieces. Alternatively, the game pieces may be thin sheets of iron foil, or paper or cardboard pieces having a varnish coating containing iron powder.

Obviously, the visible layer 17 of the game board may be provided with the game markings suitable for the game to be played, or it may be perfectly plain or colored in the event that the game consists of putting together game pieces which make up a picture or pattern.

Obviously, the use of such an adhesive-backed visible sheet for a magnetic board may be extended to applications other than game boards. Thus, such a visible sheet may be a map, chart, graph, or the like which is to be used in conjunction with a visual demonstration or explanation. In all such cases, the cost of such installations is materially reduced by virtue of the fact that the visible sheet is readily removable from the magnetic base, so that only a single magnetic base need be provided for a number of such visible sheets.

While there have been described herein and illustrated in the accompanying drawings practical embodiments of the present invention, it is to be understood that various modifications, omissions and refinements which depart from the disclosed embodiment may be adopted without departing from the spirit and scope of the present invention.

I claim:

1. A display device comprising, in combination: a thin permanently magnetic base having a smooth continuous mounting surface and formed from finely divided permanently magnetic particles dispersed throughout and imbedded within a non-magnetic binder, said base being magnetized to have a uniform power field and adapted

to hold thin ferro-magnetic foil; a flexible display sheet coextensive with said mounting surface and comprised of a non-magnetic visual layer and a thin ferro-magnetic layer, said sheet being magnetically attracted to said mounting surface by said power field, and said ferro-magnetic layer being sufficiently thin to allow said uniform power field to exert magnetic attraction through said display sheet, and a thin ferro-magnetic marker held against said visual layer by said power field.

2. A display device as defined in claim 1 wherein said ferro-magnetic layer comprises a thin ferro-magnetic foil adhesively secured to said visual layer and magnetically attracted to said permanently magnetic base.

3. A display device as defined in claim 1 wherein said base is flexible and said non-magnetic binder is comprised of a plastic material.

4. A unitary magnetic display arrangement comprising a permanently magnetic base formed of finely divided permanently magnetic particles imbedded in a binder, said base having a uniform magnetic power field; and a flexible display sheet coextensive with said permanently magnetic base, said display sheet having a smooth continuous upper layer and a lower layer, said lower layer comprising a thin ferro-magnetic foil attracted to said base by the magnetic attraction between said permanently magnetic particles and said ferro-magnetic foil, said foil being sufficiently thin to allow said magnetic field to pass through said display sheet, said upper layer of said display sheet having indicia thereon and a thin ferro-magnetic marker held onto said upper layer by said uniform magnetic field passing through said display sheet.

5. A unitary magnetic display arrangement as defined in claim 4 wherein said binder is composed of a plastic material.

6. A unitary magnetic display arrangement as defined in claim 5 wherein said thin ferro-magnetic foil has a thickness of a few hundredths of a millimeter.

7. A display device comprising, in combination: a thin permanently magnetic base having a smooth, continuous mounting surface and formed from finely divided permanently magnetic particles dispersed throughout and imbedded within a non-magnetic binder, said base being magnetized to have a uniform magnetic power field and adapted to hold thin ferro-magnetic foil; a display layer coextensive with said mounting surface and means for securing said display layer onto said mounting surface; a symbol; and a thin ferro-magnetic layer and means for securing said ferro-magnetic layer onto said symbol whereby said symbol is magnetically attracted to said display layer by said power field.

8. A display device comprising, in combination, a thin permanently magnetic base having a smooth, continuous mounting surface and formed from finely divided permanently magnetic particles dispersed throughout and imbedded within a non-magnetic binder, said base being magnetized to have a uniform magnetic power field and adapted to hold thin ferro-magnetic foil; a display layer coextensive with said mounting surface and means for securing said layer onto said mounting surface; a symbol; and a thin ferro-magnetic layer having a coating of pressure sensitive adhesive, said adhesive securing said ferro-magnetic layer onto said symbol whereby said symbol is magnetically attracted to said display layer by said power field.

References Cited in the file of this patent

UNITED STATES PATENTS

2,002,077	Darling et al.	May 21, 1935
2,500,824	Horvath	Mar. 14, 1950
2,600,505	Jones	June 17, 1952
2,600,951	Edwards	June 17, 1952
2,643,466	Bucher	June 30, 1953
2,665,913	Hlavac	Jan. 12, 1954
2,816,380	Sindell	Dec. 17, 1957