Jan. 18, 1955 H. H. MAHLER 2,699,999

METHOD OF MAKING ADHESIVE DISKS

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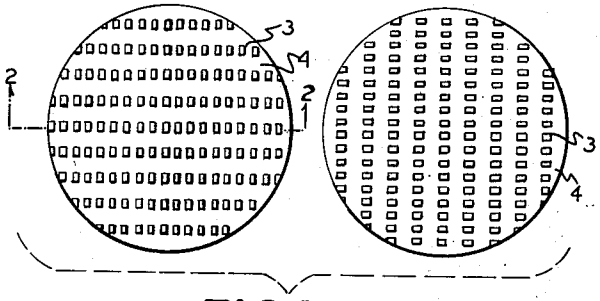


FIG. 1

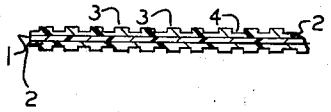


FIG. 2

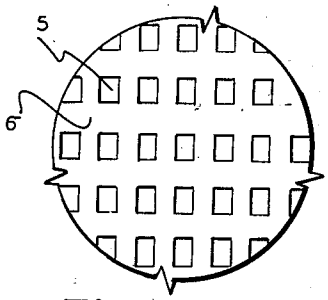


FIG. 3

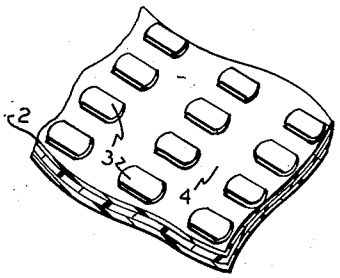


FIG. 4

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2,699,999

METHOD OF MAKING ADHESIVE DISKS

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2 Claims. (Cl. 117—4)

The present invention relates to an improvement in the invention disclosed in my copending application Serial No. 179,986, filed August 17, 1950, now Patent No. 2,658,246.

The improvement relates in particular to a modified construction which provides certain advantages for general use such as mounting ordinary papers, cards, notices, etc., on walls, billboards and on other smooth places where it is not desirable or not possible to use such articles as thumb tacks or other methods of posting the papers, cards, etc.

The present invention provides a thin flat disc or strip, whether circular, square, triangular, or other shape substantially no thicker than an ordinary paper sheet with adhesive means on both sides which does not mar the surfaces to which the article is applied.

Like in the copending application, the tab, as it may for convenience be called, is always mounted on the back of the article which it supports; and being thin and flat, approximately ranging from 7½ to 15 gauge, articles, such as a sheet of paper, will hang smoothly and evenly and appear to rest against the surface to which it is mounted.

In the present invention I have found that adhesive action may be obtained between the wall surface and a paper by the use of such a disc or strip of plastic of paper thickness on which a tacky cohesive wax material has been coated in which isolated recesses and bosses have been formed in and on the surface the recesses and bosses being spaced apart from one another substantially over the whole sheet or disc on both sides. There should be a large number of these recesses and bosses and they should be comparatively small in size of a width of approximately 1/64" and perhaps 1/16" long. The length dimension may be increased somewhat.

It appears that this type of construction not only provides a naturally strong adhesive action, but also in addition provides an evenly distributed plurality of adhesive area which have the effect of holding the sheet to be mounted with great tenacity. The wax adhesive coating preferably should be very thin, approximately .0015", but coating of the thickness of the sheet may be used. However it has been found that if the coating is under .003", a much better product is produced. This refers to the initially dipped coating before depressions and bosses have been found in the surface.

The invention will be more fully described in the specification set forth below when taken in connection with the drawings illustrating an embodiment thereof, in which:

Figure 1 shows a front and rear view of the disc or strip of the present invention.

Figure 2 shows a section on the line 2—2 of Figure 1.

Figure 3 shows an enlarged view of one face shown in Figure 1, and,

Figure 4 shows a fragmentary section in perspective of a portion of the disc of Figure 3.

In the present invention, a thin, plastic disc or sheet 1, which may be made of cellulose acetate, nitrocellulose, methylmethacrylate, polystyrene or any of the usual thermo-plastic or thermo-setting plastic materials is coated on both sides with wax coatings 2, or some equivalent material. The plastic 1 is thin, ranging between 7½ to 15 gauge and flexible, and while it may be slightly deformable, as for instance if such plastic as polyethylene is used, for the most part it should hold its form and

maintain its thickness, that is not to be stretched to any appreciable extent.

The initial coating 2—2 before embossing on both sides of the plastic sheet, may be substantially of the same thickness, but preferably thinner than the plastic sheet, of the order of .0015" to .003" and of the type of uniform adhesive which will remain substantially cohesive to itself and be easily removable from hard or finished surfaces as will be described.

I have found that such material as "Flexo Wax C" light which is a microcrystalline long chain hydrocarbon or petrolatum amorphous wax of not too hard a consistency with a melting point in the approximate range of 145° to 190° F., that is one which a person can readily scratch at ordinary temperatures and has a somewhat soft or tacky feel and can be removed with the finger nail under these temperatures is preferable to other waxes. Other waxes which may be synthetic and which ordinarily exhibit the same properties as described above, may be used. These may be vegetable, but usually are mineral or synthetic tacky waxes of the amorphous microcrystalline type having a melting point between 60° C. to 80° C., but deformable at normal room temperature. If a wax has a lower melting point, it is apt to be soft at ordinary room temperature and will not stand up as well for the present purposes which require that when the tab is used the wax shall substantially hold its form and not give way.

In the arrangement shown in Figures 1, 2 and 4, the wax surface is embossed with a series of spaced raised bosses or lines 3—3 which may be arranged in rows. Between the bosses and rows there is a normally level surface 4, which completely surrounds the raised bosses. The bosses 3 therefore serve as contact elements while the surfaces surrounding the bosses serve to provide yielding, pliable regions to help the bosses retain their prominence as they are pressed against the foreign surfaces to gain adhesion thereto. While these raised surfaces flatten slightly in use, in general they maintain a large number of small spaced areas which help to make the marks of the wax easily removable from the hard surface against which the tabs are mounted.

In Figure 3 there are a series of recesses 5, surrounded each by level regions 6. The recesses 5 provide a somewhat sectional grip as the tab is forced against the surface to which it is to adhere.

It has been found that amorphous wax material such as described above, provides also a substantial bond directly with ordinary surfaces and in addition thereto, a certain gripping action is provided because of the raised points or strips which appear to be sufficiently flexible to work their way into whatever pores the surface may have and secure the tabs to such surfaces. Both sides of the disc or tab are treated in the same fashion. In order to have some idea of the dimensions involved, it may be noted that the plastic sheet may be of the order of .007" to .015", but thinner gauges may be used if the material is inherently stiff and the wax coating may be .015" to .003" or .004" in thickness. These dimensions may be varied to some extent, the purpose being to keep the complete thickness of the disc with the wax coatings as thin as is practical.

In the arrangement indicated in Figure 1, it will be noted that the recesses and embossed areas are aligned in one direction on one surface of the tab and in the other direction on the opposite face of the tab. The recesses and embossed areas may take other shapes than those shown in the figures and preferably they should occupy in toto somewhat less than one-half of the active coated area. The recesses themselves may extend to the plastic sheet, thus forcing the embossed areas considerably above the normal pre-imprinted surface height. However, this is not necessary and in fact it is preferable if a thin wall of wax is left at the bottom of the recess.

In the manufacture of the discs or adhesive tabs herein described, a sheet of plastic of the desired thickness may be dipped, passed through or evenly coated in any other way with the amorphous wax while in a molten state. In the use of "Flexo-Wax" light, I maintain the molten bath at a temperature of about 170° F. or about 79° C. into which the plastic sheet is dipped. After

dipping, the sheet of wax will dry very rapidly on the plastic and then the sheet so coated, while it is being kept wet with cold water or thoroughly wet with cold water is passed through a pair of rollers having the proper surface to provide the desired impression.

The surface shown in the drawings is obtained by the use of a pair of rollers, each covered with a wire mesh of metal or screening of the proper selection. When the sheet coated with the wax after cooling is passed in a wet state between rolls, both sides of the sheet will become impressed and embossed with recesses and bosses as indicated in the figures. The size of the recesses and bosses have been given above, but it may be remarked that the bosses may be considerably narrow than the spaces between bosses. The bosses may be spaced 1.32" to 1/64" apart but have a width of the order of .10", and a length which may be approximately 1/16" or less. While these dimensions may be varied, I have found that the dimensions above given are not only satisfactory but appear to be preferable for providing a strong adhesive action between the tab and the sheet to be held.

After the sheet has been imprinted, the tabs may be died out by the usual cutting die methods and then mounted between cellophane sheets, in cards or in any other suitable manner.

One of the features of the present invention is that these tabs may be used over and over again, and further, while some of the wax may come off on the surface to which the tabs are applied, this wax can readily be wiped off and will not leave a stain.

Having now described my invention, I claim:

1. A method of manufacturing wafer discs of the type described which comprises coating both sides of a flat substantially nondeformable thin plastic sheet forming the base of the wafer with a thin coating of microcrystalline petrolatum amorphous wax in a melted state at approximately 175° F., allowing the coating to solidify and thereafter wetting the coated sheet with water and while so wetted imprinting on the coating with a surface roller covered with a wire mesh alternately spaced raised marks and recesses spaced apart from one another over the whole surface on each side and finally stamping out wafers from the sheets so coated and impressed.

2. A method of manufacturing wafer discs of the type described which comprises coating both sides of a flat substantially nondeformable thin plastic sheet forming the base of the wafer with a thin coating of microcrystalline petrolatum amorphous wax in a melted state at approximately 175° F., allowing the coating to solidify and thereafter wetting the coated sheet with water and while so wetted imprinting on the coating with a surface roller having means providing a desired pattern alternately spaced raised marks and recesses over the whole coating surface and finally stamping out wafers from the sheet so coated and impressed.

References Cited in the file of this patent

UNITED STATES PATENTS

1,148,783	Knappstein	Aug. 3, 1915
1,366,146	Woodley	Jan. 18, 1921
2,054,115	Abrams et al.	Sept. 15, 1936
2,373,634	Wagner	Apr. 10, 1945
2,376,305	Bauer	May 15, 1945
2,444,443	Hesselroth	July 6, 1948
2,578,339	Cuthbert	Dec. 11, 1951