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SHIPPING TAGS, LABELS, OR THE LIKE AND METHOD OF MAKING THE SAME

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Fig. 1

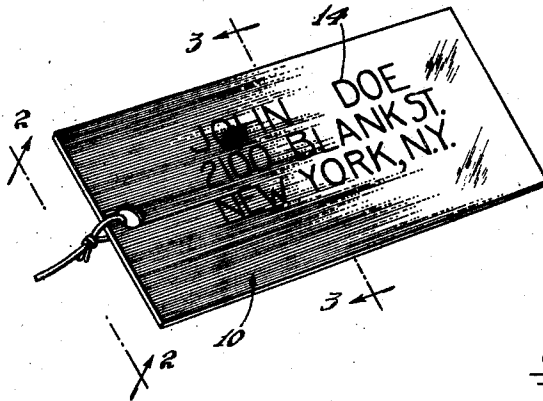


Fig. 3

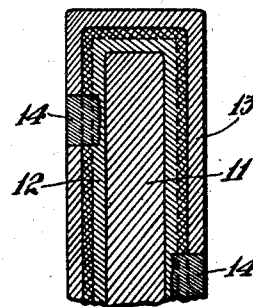
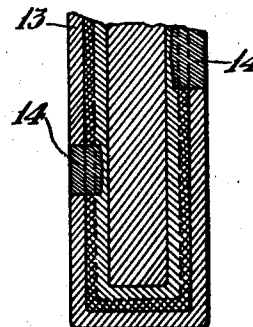
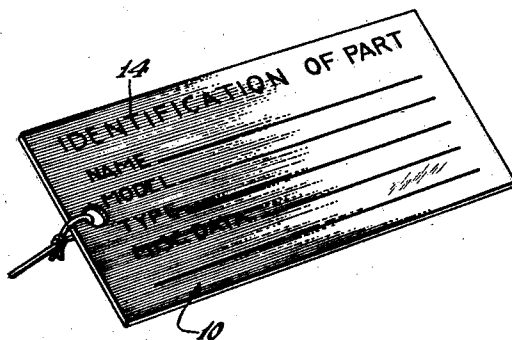


Fig. 2



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SHIPPING TAGS, LABELS, OR THE LIKE
AND METHOD OF MAKING THE SAME

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6 Claims. (Cl. 117—12)

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The present invention relates to improvements in shipping tags, labels, or the like and methods of making the same and, more particularly, to devices such as tags, identification plates and the like, adapted to be tied or otherwise affixed to objects such as machinery, said tags containing shipping instructions or other indicia.

In the shipment of machinery and parts thereof to distant points, it is highly essential that the shipping tags remain intact and that the indicia thereon be readable at all times. It has been found that paper, cardboard and analogous shipping tags rapidly deteriorate when subjected to severe climatic conditions; and likewise, that repeated handling in the course of shipment stain such tags and obliterated the markings thereon. The destruction or loss of a shipping tag, or the obliteration of its indicia, was often a matter of serious consequences, including the impossibility of identifying the machine or part to which the tag was originally affixed. While attempts have been made to solve the problem confronting the art, none, as far as I am aware, has been wholly satisfactory when carried into practice on an industrial scale.

It is the object of my invention to provide a shipping tag made of aluminum, the tag, or the sheet from which it is cut, being provided with a uniform, practically indestructible, protective oxide coating.

The invention also contemplates the provision of a special coating which is applied electrolytically, the tag or sheet being the anode in an aqueous solution through which current is passed, as hereinafter more particularly described.

It is also within the contemplation of the invention to provide an identification device of the character set forth herein, the tag or sheet of which is coated with wax after the anodizing oxide operation to substantially seal the same, dye being applied thereto for identifying indicia as hereinafter set forth.

Other advantages and objects of the present invention will become apparent from the following description taken in conjunction with the accompanying drawings, in which:

Figs. 1 and 2 are perspective views of the front and rear faces of a tag embodying my invention, and

Fig. 3 is an enlarged, fragmentary, sectional view thereof, taken on line 3—3 of Fig. 1. Said figures are not necessarily to scale.

I have found that tags made pursuant to the present invention are substantially indestructible in use and will readily absorb and adsorb ship-

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ping or other markings applied thereto. When the tag is so made and marked, the markings become a substantially integral part thereof and the tag proper will withstand most severe climatic and other conditions, such as would normally tend to corrode or break the tag, cause deterioration thereof, or obliterate markings thereon. Foreign matter which would tend to penetrate conventional tags, adheres only superficially to the tag of my invention, and may be readily wiped therefrom.

As shown in the drawings, the novel and improved tag 10 comprises the aluminum base sheet 11 having the anodized oxide coating 12, wax coating 13, and markings or indicia 14 thereon. The wax not only forms a protective surface layer 13 but also is absorbed in the oxide coating 12. The dye 14 penetrates the wax layer 13 and is adsorbed in the oxide layer 12.

I have found that when an aluminum sheet, coated with an anodized oxide film is sealed with certain oil or wax-like materials, it is protectively sealed against staining but is scribable by the use of means described herein. By so sealing the oxide film, its sensitivity to dyes is extended.

In carrying out my invention, the aluminum sheet may be anodized by economical continuous methods, protectively sealed as hereinafter described, cut into desired shapes, and marketed for subsequent coloring and other operations. Tags made pursuant to my invention may be distinctively colored.

The term "aluminous material" as employed in the claims annexed hereto shall be deemed to mean aluminum or any oxidizable aluminum alloy. The term "tag" shall be deemed to mean any indicia bearing strip of sheet material adapted for use as a shipping tag, or label, or a blank strip adapted for use as a shipping tag, label, or the like without indicia thereon, but on which indicia may be inscribed during subsequent use. The term "wax" shall be deemed to mean any wax or waxy material suitable for sealing the pores of an aluminum or aluminum alloy sheet having an anodized oxide film.

Pursuant to my invention, the aluminum oxide film is preferably prepared by any suitable method well known to those skilled in the art. In general, higher current densities and higher bath temperatures give more absorbent coatings. Where flexibility of the film is necessary, alternating current in oxalic acid solutions may be superior. When sulfuric acid electrolytes are used, good results are obtained by dipping the

anodized aluminum in a one per cent solution of a mild alkali, such as ammonium hydroxide.

After anodizing, rinsing, and drying, the aluminum is dipped in a sealing solution, preferably of wax-like material, e. g., paraffin wax, carnauba wax, Montan wax, or rosin, dissolved in turpentine, toluol, xylol or other organic solvent. Good results are also obtained by emulsifying the wax with water. The sealing solution is usually employed hot.

The article is removed from the sealing solution and allowed to dry. It is then heated to a temperature above the melting point of the wax used in order to seal or close any pores in the wax which may have been formed by evaporation of the solvent from the sealing solution.

The aluminum article may now be further cut or pressed into the desired shape. The wax-sealed film is sufficiently resistant to staining so that dye in water solutions, if applied at room temperature, will not penetrate. Marks may be easily removed by wiping.

After the anodizing operations, a powdery deposit is left on the aluminum surface. This deposit can be removed by a mild abrasive without harming the coating. For this purpose I may use steel wool and soapy water, for example.

The aluminum article is now ready for applying desired indicia by the use of a dye. The dye may be applied by the use of dye solutions which may be prepared in several ways. In one method I dissolve the dye in wax and emulsify the wax solution of dye in water. In another method I dissolve the dye in oil or other organic solvent. In a further alternative method, I dissolve the dye in wax and prepare a crayon. For use with tags or labels, the emulsion or crayon is most suitable. An ordinary writing pen may be used with the emulsion. After inscribing, the emulsion is allowed to dry. The tag is then heated just above the melting point of the solvent wax for a few minutes, cooled, and the excess wax removed. By the use of this method, the dye penetrates the wax film and is absorbed both in the aluminum oxide and in the wax coating and the wax held in the pores of the anodized oxide coating. The emulsion which is used in applying the indicia to the wax coating of the tag or label may be applied by means of stencils, by means of a spray or may be applied with a brush. Also the indicia which is to be used may be applied by means of an emulsion or oil containing the dye in the form of a printing ink. In any case, the consistency of the emulsion may be varied to suit the applicator used. By this novel method of applying indicia by the use of dyes, excellent dye penetration is obtained. If the heating is carefully controlled, the surface tension of the molten wax solvent will be such that it will not "run" and very sharp lines can be obtained. The same procedure is used with the crayon. The greater the dye concentration in the wax solvent the more intense will be the color. The method of sealing and dyeing described herein is also applicable to certain oxide films or coatings formed by dipping aluminum in chemical baths.

As a variation, the oil or emulsion may be applied cold and the aluminum article heated to effect the dye penetration. This method of dyeing surfaces extends the uses of aluminum by permitting the preparation and sale of anodized and sealed articles suitable for later coloring.

In general, any dye (for example, Xylene-azo-Beta Naphthol, color index No. 73) may be used which is soluble in the wax film. Any solvent

containing the selected dye will color the metal when heated to the melting point of the wax film. Better dye penetration is obtained, however, by using a wax as dye solvent so that a molten wax dye solution contacts with the oxide film. Another advantage of the use of a wax solvent is that the dye is inactive until the wax containing the dye is heated above the melting point of the wax solvent. If an error is made in the inscription applied to a tag before the wax containing the dye is heated, the emulsion may be easily removed and the tag reinscribed. The same advantages are true of wax crayons.

I have found the following procedure satisfactory for the purpose herein described.

The aluminum sheet or tag is anodized in about a 25% sulfuric acid solution at about 85° F. for about 30 minutes with a current density of about 18 amperes per square foot. The sheet or tag is then removed from the electrolyte, rinsed in cold water, neutralized in about a one per cent solution of ammonium hydroxide, and is finally rinsed in cold water and dried. The sheet is next dipped in a solution of about one per cent carnauba wax and about one per cent paraffin wax in xylene at approximately 160° F. for about five minutes. It is removed, allowed to dry, and then heated in an air oven at approximately 270° F. for about 15 minutes. After cooling, the surface is cleaned by rubbing same with steel wool and soapy water, and is then rinsed and dried. The inscription to be applied may then be made with an ordinary writing pen and an emulsion with the following composition by weight; about 22% paraffin with dye dissolved therein, about 2¼% stearic acid, about ¼% triethanolamine and about 75% water. The emulsion is allowed to dry, the tag is heated to about 130° F. for about 15 minutes, cooled and excess wax which was applied in making the inscription may then be removed in any suitable manner.

An alternate method for sealing the anodized coating is as follows:

Emulsify carnauba wax with stearic acid and water, using triethanolamine as the emulsifying agent. Dilute to the desired concentration with water. Immerse the freshly anodized aluminum sheet or tag in the emulsion and then remove and dry the same. The sheet or tag may then be heated to a temperature above the melting point of the wax to allow wax penetration. The sealed coating may then have an inscription applied by the use of a dye as in the foregoing example.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:

1. A shipping tag, label or the like, having a visible inscription thereon which comprises a sheet of aluminous material having an anodized oxide coating thereon, a non-porous wax coating over the said oxide coating sealing the said anodized coating and a visible inscription on said wax coating composed of a dye penetrating said wax coating and onto said anodized oxide coating, whereby the said tag, label or the like is adapted to withstand abrasion and adverse weather conditions without impairing the legibility of the said inscription thereon.

2. A shipping tag, label, or the like, having visible permanent indicia thereon which comprises a sheet of aluminum having an anodized oxide coating thereon, a non-porous wax protective coating over the said oxide coating sealing the said oxide coating and identifying indicia in-

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scribed on said protective coating by means of a visible color dye penetrating through said protective coating onto said anodized oxide coating in sharp definitive lines so as to be legible after being subjected to abrasion and adverse atmospheric conditions.

3. A shipping tag, label, or the like, carrying visible permanent indicia thereon which comprises a sheet of aluminum the exterior surface of which is coated with an anodized oxide layer, a non-porous wax protective coating extending over the said oxide layer so as to effectively seal the same, and visible permanent indicia inscribed on said protective coating by means of a visible azo dye extending through said protective coating onto said anodized oxide layer in sharp definitive lines so as to be legible after being subjected to abrasion even with the removal of said non-porous wax protective coating.

4. A method of making a shipping tag, label, or the like, having a visible inscription thereon which comprises applying a wax coating to a sheet of aluminous material having an anodized oxide coating, heating the said sheet to a temperature above the melting point of the wax of said coating to form a non-porous sealing coating, marking a visible inscription on said wax coating by means of a solution of a visible dye and heating the said sheet sufficiently to cause penetration of the said dye through the said non-porous sealing coating.

5. A method of making a shipping tag, label, or the like, having visible permanent identifying indicia thereon which comprises applying a wax-like coating to a sheet of aluminum having an anodized oxide coating by dipping the said sheet in a sealing solution of a wax-like material, drying the said sheet, heating the dried sheet to a temperature above the melting point of the said wax-like material to seal the pores of the said wax-like coating, applying a visible color dye dissolved in a wax solvent to the said wax-like coating to form visible identifying indicia thereon and heating the said sheet just above the melting

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point of the wax to provide penetration of the dye through said wax-like coating.

6. A method of making a shipping tag, label, or the like, having visible permanent indicia thereon which comprises immersing a sheet of aluminum having an anodized oxide coating in a wax solution, withdrawing the sheet from the solution and drying the same to provide a wax coating thereon, heating the coated sheet to a temperature above the melting point of the wax coating to form a non-porous protective coating, cooling the sheet to harden the wax coating thereon, applying an excess of a solution of a visible azo dye dissolved in wax on said wax coating, said dye solution being applied in sharp definitive lines to form visible identifying indicia on said coating, heating the said sheet just above the melting point of the solvent wax to permit the dye to penetrate through the wax coating, permitting the said sheet to cool below the melting point of the wax and removing excess wax to provide an even, smooth surface.

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