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K. KILCHLING

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COATED METAL FOIL AND METHOD OF MANUFACTURE THEREOF

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Fig. 1.

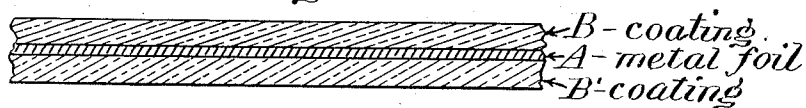
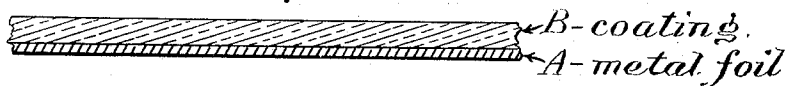


Fig. 2.



INVENTOR,

Karl Kilchling

BY

Morrison, Kennedy & Campbell

ATTORNEYS.

UNITED STATES PATENT OFFICE

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COATED METAL FOIL AND METHOD OF
MANUFACTURE THEREOF

Karl Kilchling, Freiburg, Germany

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and in Germany December 30, 1929

2 Claims. (Cl. 91—68)

This invention relates to coated metal foils, and method of manufacture thereof. More particularly, the invention relates to the strengthening of various metal foils by means of applied coatings of cellulose derivatives upon only one or upon both sides thereof. Derivatives of cellulose are mentioned as a preferable coating, and this term is intended to include all such derivatives which are capable of forming films or coatings, such for example as cellulose hydrates, including those from which cellophane is produced, or cellulose ethers including ethylcellulose, or cellulose esters including nitrocellulose.

The field of utility of coated or strengthened metal foils is large. As an example, the packing of blocks or bars of chocolate, or of various other foods or materials, is improved by the substitution of such coated or strengthened foils in place of the bare metal foils now commonly used and which are known to have a low strength and to be easily injured, torn or crumpled.

It has heretofore been suggested to increase the resistance to corrosion of metal foils by applying an extremely thin coating of rubber or cellulose derivative, but for these purposes the thinness of the coating is so extreme that its strength is insufficient to reinforce materially the metal foil or render it available in cases, for example, where the packed material is subject to strains. The corrosion resisting coatings have a thickness in the neighborhood of .001 to .002 mm., which is about five to ten times thinner than ordinary metal foil. More frequently the metal foils have been pasted upon paper. These known coated foils have frequently been combined with textile material, leather or the like. Also uncoated metal foils have been united with leather or textile material, and in order to increase resistance to atmospheric action they have been supplied sometimes with translucent or transparent coatings. In pasting such foils a cement has been used such as dextrin. In some cases the foils have been covered with lacquers either of the oil type or spirit type. All of these known coated foils are exceedingly stiff, in a degree depending on the nature of the strengthening material or adhesive, and the products are not available where substantial pliability or suppleness is required.

It is therefore an object of the present invention to afford a coated metal foil wherein the coating gives substantially increased strength and resistance to injury or crumpling, while retaining a substantial degree of pliability or suppleness, for various practical uses.

According to the present invention the metal foil to be treated is supplied either on one side or on both sides with a substantial coating of cellulose derivative. For example the metal foil may have a thickness in the neighborhood of .009 to .02 mm., and each cellulose derivative coating should be about or at least as thick as the foil itself, or in some cases substantially thicker. Very satisfactory products are obtained by means of a coating that is several times thicker than the metal foil, for instance a coating of .05 mm. In any of these cases the completed product or coated foil is of very substantial and satisfactory strength.

Referring further to the prior known extremely thin coatings applied to protect foils from corrosion it was customary to combine such coatings with the foil by means of an adhesive or agglutinant, and for this purpose it was necessary to make separately the thin films and then paste them upon the foils, a quite difficult and expensive procedure. With the present invention on the contrary the foils are spread out smoothly on a support and the cellulose derivatives are applied or spread directly upon the foils while in a liquid or pasty condition by flowing or spraying, following which the solvent of the coating material is allowed to evaporate, or the liquid or pasty coating allowed to solidify, thus simply and cheaply completing the process. It was found with this invention that no adhesive is necessary, and that the coating may be simultaneously formed and applied to the foil, and this gives a very good union.

In the drawing Figure 1 in section, and much enlarged, shows a short section of foil coated on both sides, and Fig. 2 a similar section of foil coated on one side only. In each case the metal foil A, for example from .009 to .020 mm. thick, has the coating B or coatings B and B' applied directly to its surface, the coating, for example being .050 mm. thick.

The new material or product of this invention possesses a desirable metallic appearance, together with opacity to light and impermeability to gaseous substances. The product while greatly strengthened is at the same time pliable and is free from liability to crumple. Incidentally it possesses a very high resistance to corrosion.

If desired the coatings applied according to this invention may be colored either before or after application. The finished material can be stamped or decorated in various ways, for ornamental or other purposes. The product is useful for various practical purposes and especially

as a packing or wrapping material for making packages which require substantially high strength along with pliability and resistance to corrosion.

3 What is claimed is:

1. The method of manufacturing wrapping material in the form of a composite sheet having a layer of metal foil of thickness in the neighborhood of .009 to .020 millimeters combined with
10 a strong pliable coating on one or both sides thereof; such method consisting in spreading out flatly the thin metal foil, lacking substantial strength, then simultaneously producing and applying directly upon the metal foil, without
15 interposed adhesive, in quantity sufficient to form a permanent coating at least as thick as the metal foil, a layer in fluent condition of a derivative of cellulose adapted to set and solidify into a pliable coating of good tensile strength,
20 and finally allowing such coating to set into integrally cohering permanent attachment to the

metal foil to afford substantially the entire permanent strength of the completed wrapping material.

2. As a product of manufacture a wrapping material in the form of a composite sheet of
80 strong pliable quality, the same consisting of a thin layer of metal foil of thickness in the neighborhood of .009 to .020 millimeters, lacking substantial strength, and at one or both sides thereof, without interposed adhesive, a strong pliable
85 coating in direct and permanent union therewith, such coating composed of a layer of cellulose derivative of high pliability and tensile strength at least as thick as the metal foil, and
90 said coating layer adhering permanently and directly with said foil by reason of the setting of the coating layer while in contact with the foil, the coating layer affording substantially the entire permanent strength of the wrapping material.

KARL KILCHLING.

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