United States Patent Office.

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Letters Patent No. 101,142, *dated March* 22, 1870.

IMPROVEMENT IN DIES FOR THE MANUFACTURE OF IMITATION-STRAW GOODS

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, HENRY LOEWENBERG, of the city, county and State of New York, have invented new and useful Dies for the Manufacture of Imitation-Straw Goods; and that the following is a full, clear, and exact description of my invention.

My invention consists of a compound metal-faced die, composed of a body united to a metal skin, which is a direct counterpart of the surface of an article of natural straw, of the form and size of the imitation-straw goods to be manufactured, so that said die possesses the advantages of a die of solid metal, and possesses the property of imparting to the surface of imitation goods against which it is pressed a surface which is a substantial *fac simile* of the original natural-straw article.

My invention consists further, of the combination of the said die with a counter-die, to support the material while it is pressed by the die.

In order that my invention may be fully understood, I will proceed to describe the best mode with which I am acquainted of producing my new dies.

I procure an article of natural straw, of the form and size of the imitation articles to be manufactured by the use of my dies, as, for example, a natural Leghorn-straw bonnet, or I procure the natural-straw braid and have it made into the desired article in the usual manner. To the interior of this article is applied a resinous preparation, composed of beeswax, or of equal quantities of weight of gutta-percha and beeswax, which are simmered together at about the boiling-point of the mixture until they are thoroughly combined. This preparation is applied while hot by means of a brush, and in such quantities as to penetrate the straw article. The object of this application is to render the interior of the straw practically impenetrable by acid or alkaline solutions, and to stiffen the article.

To the exterior of the article is applied a resinous varnish, and the varnish which is preferred for this purpose is either a solution of gum-ammoniac in alcohol, in the proportions of one pound of the gum to three pounds of alcohol of ninety-five per cent., or the "flocking varnish" used by manufacturers of wall-paper and composed of linseed-oil, gum-copal, Burgundy pitch, and spirits of turpentine. This varnish is applied with a brush, and should be sufficiently liquid to strike into the article until it meets the composition previously applied to the interior, so that all the pores of the article are filled up with a neutral substance. If the flocking varnish, when purchased from the manufacturer, is not sufficiently liquid for this purpose, its consistency should be reduced by adding spirits of turpentine to it.

The purpose of filling the pores of the straw is to prevent acid or alkaline solutions from penetrating the substance of the straw, and the varnish also serves to retain a coating of plumbago when this material is used to make the surface a conductor of electricity.

While the exterior of the varnished article is still sticky, powdered black-lead or plumbago is applied to it and brushed evenly and thoroughly, so as to produce a surface that will conduct electricity without materially effecting the form of the surface of the straw.

Then the prepared article is stayed in the form of the die by sticking it fast to a stay of sheet-brass, by warming the composition on its interior. The sheet-brass stay should approximate in form to that of the interior of the article, and should be coated with beeswax, or with the composition of gutta-percha and beeswax. The prepared article so stayed is immersed in a suitable electrotyping-bath, is connected with a battery, and is electrotyped with copper in the usual manner, which being well known does not require a detailed description.

When the electrotype has formed upon the article of the desired thickness, say, about one-fortieth of an inch, the article with the electrotype upon it is removed from the bath, and the article is stripped out of the electrotype, which has the form of a shell whose interior is a counterpart in size, surface, and form of the natural-straw article upon which it has been deposited.

The shell is tinned upon its exterior by being heated hot enough to melt tin-foil, which is applied to it in the usual manner practiced in preparing electrotypes for backing, or the back of the shell may be tinned by the use of a tinsmith's copper in the usual way practiced by tinsmiths, and the shell is then backed by casting melted type-metal upon it in the usual manner practised by electrotypers, the face of the shell being first rubbed with clay to prevent the accidental adhesion of type-metal to it.

This backing operation may be effected in several ways; thus, the shell may be placed upon a table and surrounded by a box or mold of the required form of the die, and then melted type-metal may be poured into the mold, care being taken, as is customary in such operations, to prevent the shell from rising in the mold; or the shell may be supported during the operation upon a bed of dry clay, well rammed, or of dry plaster of Paris; or the shell may be supported upon a core of type-metal, formed by casting type-metal into the shell, which should be previously rubbed with clay to prevent adhesion; and if necessary the exterior of the shell may be supported during the casting of the core by a mold-board, of wood, or by a bedding of dry clay or dry plaster, well rammed.

The type-metal unites with the tinned surface of the

shell and completes the die, which, when cold, is removed from the mold and dressed up in a planer for planing metals, so that its bottom is true and level, and its exterior is of the exact size required.

The die thus formed, when cleansed of the clay, is an article having at one side a skin whose surface is a substantial counterpart in metal of the natural-straw article which has served as a pattern, while the body of the die fits all the inequalities of the copper skin that forms its metallic surface, however minute such inequalities may be, is firmly united to this skin, so that the die is for all practical purposes as solid as if made of one piece, and forms an equable support for such skin, however its surface may vary from a plane.

The die thus produced is used for manufacturing imitation-straw goods, in connection with a counter-die, and the said counter die may be prepared by pouring melted type-metal into the cavity of the die after the surface thereof has been rubbed by hand with fine paper-clay.

If the base of the counter-die is to project beyond the cavity of the die, a mold is placed over the die before pouring in the type-metal. Moreover, such portion of the surface of the type-metal of the die as may be exposed to the action of such melted type metal is prevented from adhering thereto by being first coated with paper-clay or some other material that will answer the purpose.

The mass of type-metal is permitted to cool, and then has its base dressed off true in a planer, after which its surface is reduced by filing or scraping, sufficiently to permit of the insertion between it and the die of one of the articles to be pressed, and also of a thin sheet of India rubber.

The rubber used should be vulcanized, and about one-eighth of an inch in thickness, and the extent of reduction of the counter-die is determined by trials, consisting in inserting it with the rubber and an article upon it into the die, after the latter has been cleansed of the clay, and cutting away the surface progressively until an equal bearing is obtained over the entire surface of the article to be pressed.

If the above operations have been carefully performed, the two articles, die and counter-die, thereby produced, will constitute a set of dies suitable for pressing material into the form of the natural-straw article, and for imparting to the said material a surface which is substantially a *fac simile* of that article.

Having thus described my new die and the combination of it with the counter-die, I declare that I do not claim every kind of straw-surfaced metal die, nor every straw-surfaced metal die made in part by the electrotype process, because I am aware that dies have been engraved so that their surfaces resembled that of straw goods; also, that dies have been made by electrotyping casts or molds of straw goods, and then tinning the electrotypes and casting type-metal upon them; and I am aware that a description exists of dies made by electrotyping straw goods and casting melted zinc and brass upon the electrotypes.

As the first and second of the above kind of straw-faced dies are not direct counterparts of the natural straw, but are either copies of it made by eye or counterparts of casts or molds, and consequently have all the imperfections of such casts or molds, I do not include them in my claim of invention; and as, in straw-faced dies of the third kind, (if ever they were made,) the skin and body are not united, I do not include them in my claim. I further declare that I am aware that straw-faced dies of one of the above kinds have been used in combination with a counter-die; I therefore do not claim the combination of every kind of straw-faced die with a counter-die; but

What I claim as my invention, and desire to secure by Letters Patent, is—

The compound metal-faced straw-surface die, composed of a body united to a metal skin which is a direct counterpart of an article of natural straw, substantially as before described.

Also, the combination of the said compound metal-faced straw-surface die with a counter-die, substantially as before described.

In testimony whereof I have hereto set my hand this 6th day of March, A. D. 1867.

HENRY LOEWENBERG.

Witnesses:

JNO. D. PATTEN,

D. P. COWL.