I. D. HURLBUT.

COMPOSITION FOR RELIEF PRINTING.

APPLICATION FILED JAN. 26, 1912.

1,047,892. Patented Dec. 17, 1912.

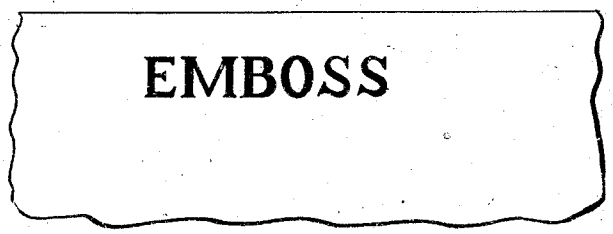

Fig. 1.

Fig. 2.

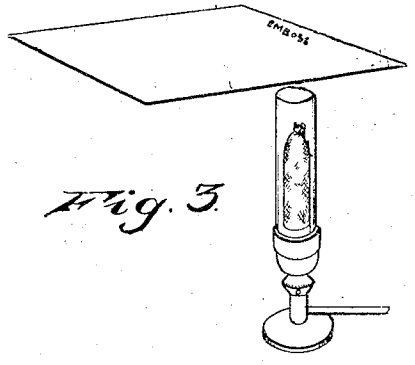

Fig. 3.

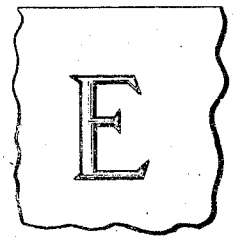

Fig. 4.

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Witnesses

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COMPOSITION FOR RELIEF PRINTING.

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To all whom it may concern:

Be it known that I, IRA D. HURLBUT, a citizen of the United States, residing at Prairie du Chien, in the county of Crawford, State of Wisconsin, have invented new and useful Improvements in Compositions for Relief Printing, of which the following is a specification.

My invention relates to the process of mechanical relief printing in imitation of steel die stamping, differing therefrom in that the relief effects are laid on instead of being impressed into the sheets by male and female dies, and is applicable to commercial stationery, business and personal cards, booklet covers, and any other work in which high art effects are desirable.

The object of this invention is to make available to every printer the production of embossed or mechanical relief effects without the use of metal or composition dies or the machinery necessary to their successful manipulation.

In carrying out my process I provide a material or composition that is applied to the printed matter before it dries, said composition being in finely granulated form and consisting of the resinous constituent of gum elemi and a saccharine matter, preferably candied honey. After applying this composition the printed matter is subjected to a temperature sufficient to fuse the composition and closely associate it with the print, and then cooled. The result is the production of a relief similar to the work accomplished in the use of steel die stamping that is not only an improvement therein, because of the gloss effect secured by the composition, but also more reasonable in cost of production.

My improved process will be described in detail hereinafter, and illustrated in the accompanying drawings, in which—

Figure 1 is a view illustrating the first step of my process, laying on the ink design, Fig. 2, a view illustrating the second step, placing the granulated composition on the ink design, Fig. 3, a view showing the third step, subjecting the printed production to the action of heat, and Fig. 4, a view of the completed production.

In carrying out my improved process I first print the design on any suitable material in the usual manner from type or relief plate with an ink containing the minimum content of oily matter and the maximum content of a drying agent consistent with distribution and color. The sole function of the ink in the process is to define the design, and to color the superstructure that is to be subsequently applied. The drying agent in the ink serves the double purpose of hardening not only the ink, but also the relief which is to be added. While inks without the usual drying agents, in common use, would finally harden by exposure, a drying agent in the ink is essential if the finished product is to be available for immediate use.

The first step in my process is shown in Fig. 1 of the drawings.

The design having been printed, as stated above, the next step in the development of the relief is the application of the composition that forms the relief to the design before it has dried. This composition is an essential feature of my process and consists of the resin of gum elemi and saccharine matter, preferably candied honey in the proportions of approximately ninety-nine (99) parts of gum elemi to one (1) part of candied honey, although in practice I may use as high as twenty-five per cent. of candied honey according to the crystallization of the honey used, and any other saccharine matter that will impart toughness and flexibility may be employed instead of the honey. The gum alone or combined with "drying agents" is quite brittle in its hardened condition and relief work produced with it readily loses its surface finish with the abrasion incident to use. The addition of saccharine matter of suitable character and in proper proportion overcomes this fault.

In preparing the material I take the gum elemi of commerce which is a soft, plastic aggregate consisting of resin combined with oil and sap. The sap and the greater portion of the oil is removed in any suitable manner, such, for instance, as by the application of heat, and the resultant is a flexibly

fragible substance, principally resinous, having some of the characteristics of rubber. To this material I add approximately one per cent. of saccharine matter preferably in the form of candied honey. The mixed resin and saccharine matter or candied honey is then ground into granules of various sizes within narrow limits, the smallest of which will not pass through No. 8 bolt cloth, and the largest will pass through No. 50 strainer cloth. The fine dust-like particles that will pass through a dust sieve are of no availability in my process because not enough of the material in this form would adhere to the printed sheet to produce a relief effect that would be apparent to the eye or touch.

In applying this composition to the printed design, as stated above, it is necessary to adapt the granules to the strength of the lines of the design, the smallest granules being adapted to the small details and finer lines of the design, while the largest granules are adapted to the strongest lines. The material is applied to the design while still wet by pouring from a suitable receptacle, or in any other desired manner, the excess of the material, that does not adhere to the design, being removed by striking the printed sheet on its edge. This step in my process is illustrated in Fig. 2, the printed design being shown covered with granules of the composition described. The next step in the process is the application of heat to the printed and covered design to melt the granules adhering thereto, this step of the process being illustrated in Fig. 3, the temperature being sufficient to liquefy the granules so that they are fused together, but not so that the composition will run outside of the outlines of the printed design. After this the composition is allowed to cool, and the pigment of the ink and the drier contained therein having become incorporated with the composition, the pigment serving to give the composition the color of the printed design, while the drier causes the composition to quickly set and harden, so that the finished product shown in Fig. 4, is available for immediate use.

As stated, the pigment of the ink unites with the relief composition and serves to color the relief, but if a more highly colored production is desired the composition may be colored by a pigment while being prepared, and if an illuminated product is desired sufficient gold, copper, aluminum or other metallic powder may be applied to the granules that will adhere thereto without alowing much free metallic powder in the aggregate. When the composition is used to which a metallic powder has been added, as above described, the metallic powder appears wholly on the surface of the finished product in a thin layer of metal, the effect being a very close imitation of the illuminated product of the die stamp and allied methods.

I am aware that a process has been heretofore patented for drying and varnishing prints in which it is stated that the varnishing matter may be comminuted in any way and may be any of the commercial gums—as gum-dammar, gum-sandarac, kauri, or any other similar varnishing material capable of being applied as fine dried powder, and applied to a design for the purpose of giving a brilliant effect, I do not claim this as my invention. The finished product of this patented process is as the patentee states merely a varnished print, while the finished product of my invention is an embossed surface varying in thickness according to the lines of the design and the size of the granules used and converging at the center by reason of the high surface tension of my composition. This surface tension is a peculiar and an essential feature of my composition which is not obtainable by the use of any of the commercial gums specified in said patent for varnished prints, nor, so far as I am aware, any resinous gum except the resin of gum elemi and saccharine matter in granular form. On the contrary all of the other gums or resins thereof have a tendency to spread and produce false effects.

My invention relates to the production of relief or embossed designs on printed surfaces and this can only be produced by the method of using granules of a fusible composition of graduated or assorted sizes, as the dust-like powder used in the patented process will simply cover the design and when melted and cooled will give an illuminated effect but no perceptible relief or emboss. Furthermore the addition of a drier to any gum for use in this or analogous processes, is entirely impracticable because to be a drier it must fuse at a higher temperature than the gum, if at all, and such a combination would be fatal to successful relief printing. Furthermore I have specified a minimum and maximum size of granules of my composition as used in the process, and, so far as the minimum size is concerned this is about the limit of practicability but it may be stated that the wider the printed surface to be treated the larger the granule employed must be, this ratio between the width of the printed surface and the size of the granule being direct, but it will be understood that there is a limit of practicability in maximum size of the granule as well as in the minimum.

Having thus described my invention what I claim is—

1. A composition for use in producing relief printing effects containing the resin of gum elemi in granular form.

2. A composition for use in producing relief printing effects consisting of the resin

of gum elemi and saccharine matter in granular form.

3. A composition for use in producing relief printing effects consisting of the resin of gum elemi and candied honey.

4. A composition for use in producing relief printing effects consisting of the resin of gum elemi, approximately ninety-nine parts, and candied honey approximately one part.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

IRA D. HURLBUT.

Witnesses:
D. S. WALKER,
W. R. GRAVES.