

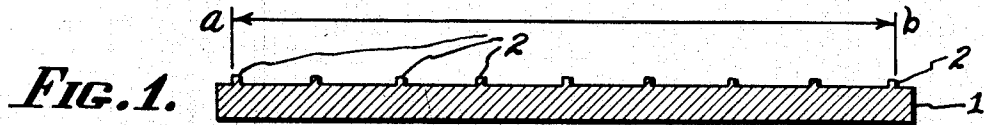
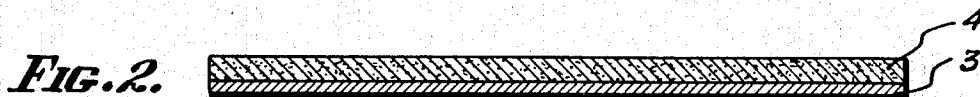
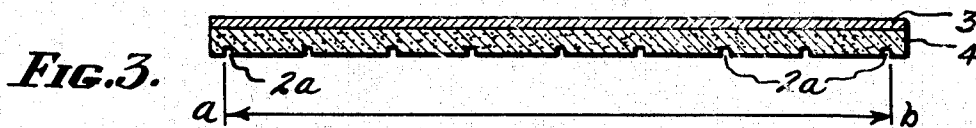
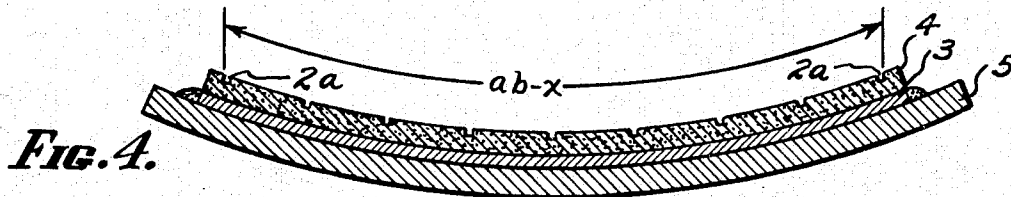
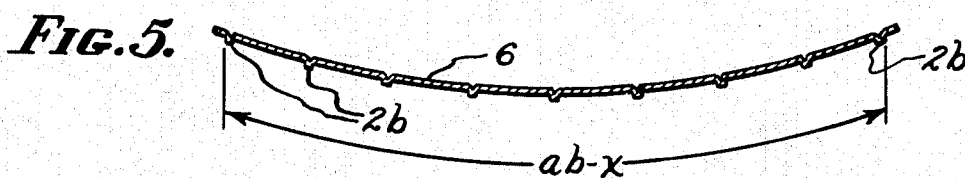
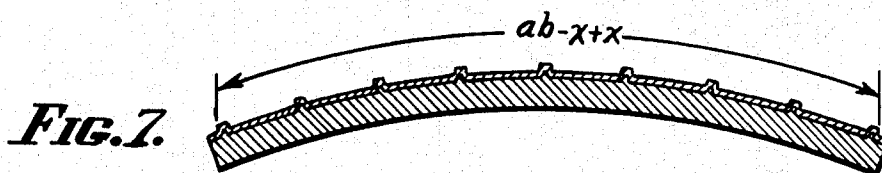
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2,229,457

MANUFACTURE OF ELECTROTYPES

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MANUFACTURE OF ELECTROTYPES

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2 Claims. (Cl. 204—6)

My invention relates to the manufacture of electrotypes and particularly to a step in the process wherein the expansion of the printing surface of the electrotype to accommodate a rotary printing cylinder is compensated. In the manufacture of electrotypes where the customer provides a pattern, whether it be a photo-engraving, wood-cut or a form of type matter and plates, the electrotype is a duplicate of the original.

Where electrotypes in the form of printing plates for rotary presses having curved printing cylinders are required, it has heretofore been difficult to provide adequate compensation for the expansion of the printing surface of the printing plate when the electrotype mounted on a metal carrying bed is curved to compensate for the curvature of the printing cylinder. Various methods have been proposed wherein the soft metal of the base of the printing plate is softened during the curving operation, and permits the curving of the plate without undue expansion of its surface.

It is the object of my invention to provide by a change in one of the steps in preparing the electrotype, to compensate for such expansion as occurs during the curving of the finished electrotype to the arc of curvature of the printing cylinder.

The steps in the preparation of electrotypes which are ordinarily followed, and the terms employed, may be briefly described as follows: the original plate from which the electrotype is to be made is called a pattern. The first step in the process is to prepare a case. A case is a flat metal plate having on one side a layer of wax which, when impressed, forms a mold for the finished electrotype. The case is inverted and placed in a press so that the wax surface will be in contact with the printing surface of the pattern. The press is actuated and the wax surface of the case is squeezed by the press under high pressure, causing the wax to fill completely all the low areas of the original.

After molding the case is called the mold. The mold is then treated with graphite to form a cathodic surface to receive the deposit of the metal, either copper or nickel, which is to form the printing surface of the electrotype.

The mold is then exposed to the electrolytic bath for a sufficient period to cause the electroplating thereon of the metal of the bath to form an integral self-supporting sheet.

This sheet, the surface of which conforms to

the original pattern, is then backed up with metal foil and placed in a molten soft metal bath where a soft metal backing is provided for the electrotype sheet.

If the plate formed in accordance with the previous regular steps of manufacture is to be used for a flat bed printing press, it will be obvious that the dimensions of the printing surface of the electrotype will conform to the dimensions of the surface of the pattern. However, if the printing plate, or as it is commonly called, the electrotype, is to be used for a rotary press, during the curving operation, the surface of the electrotype is expanded, as a result of which inaccurate registry on a rotary printing press is likely to result.

Broadly it is the object of my invention during the steps prior to the formation of the electrotype in the electrolytic bath, to contract the surface of the mold so that when the electrotype is subsequently curved, the expansion to fit a particular printing cylinder will be substantially exactly the same as the contraction prior to the formation of the thin electrotype sheet.

The above objects and other objects which will be more specifically recited, I accomplish by that sequence of process operations as are set forth in the ensuing diagrammatic illustrations.

Referring to the drawing:

Figure 1 is a diagrammatic sectional view of a pattern.

Fig. 2 is a diagrammatic sectional view of a case.

Fig. 3 is a diagrammatic sectional view of a mold.

Fig. 4 is a diagrammatic sectional view illustrating the inventive step in my proposed process wherein the surface of the mold is contracted to compensate for subsequent expansion when the finished electrotype is curved to compensate for the curvature of the printing cylinder.

Fig. 5 is a diagrammatic sectional view of the electrotype sheet after its removal from the mold.

Fig. 6 is a diagrammatic sectional view of the electrotype after receiving its backing of soft metal.

Fig. 7 is a diagrammatic sectional view of the electrotype during the curving operation in preparation for use on a rotary printing press.

The pattern 1, has elevated portions 2, which may be type surfaces, printing surfaces for illustrations, or other decorative motifs. Let us as-

sume that the distance between the exterior elements 2 is represented by the distance a b .

In Fig. 2 the soft metal backing 3 is ordinarily about $\frac{90}{1000}$ inch thick, and the wax surface 4 sufficiently thick to make the thickness of the case $\frac{250}{1000}$ inch.

In Fig. 3 the case is shown after being subjected to pressure in a molding press, and the surface of the mold will, of course, have indentations 2a corresponding to the raised portions 2 of the original pattern. The spacing between the exterior portions of the indentations 2a will conform to the spacing between the raised portions 2 in the original pattern.

Assuming that electrotypes are being prepared for a printing press having a diameter of 54 inches, I prepare a curved metal plate 5 illustrated in Fig. 4, which has a peripheral curvature corresponding to the diameter of 54 inches. I next invert the mold illustrated in Fig. 3, and solder the backing plate 3 to the plate 5. During this operation the space between the elements 2a is contracted so that the distance between these elements may be considered the equivalent of a $b-x$.

The electrotype sheet 6 illustrated in Fig. 5 is deposited on the surface of the wax 4. The electrotype will have elements 2b conforming to the elements 2 in the original pattern, but the spacing of these elements will still remain a $b-x$.

The electrotype shell 6 which ordinarily will be from 7 to 10 thousandths of an inch in thickness, is then laid flat in the bath where the backing 7 of lead or type metal is applied. Since the shell is so thin, when it is laid out flat, there is no contraction of the printing surface and it still remains a $b-x$.

However, the completed electrotype which is formed when the backing plate 7 solidifies, on the under surface of the electrotype shell, cannot be curved without causing expansion of its printing surface.

Fig. 7 illustrates the completed electrotype curved on the same arc in which the mold illustrated in Fig. 4 was originally curved, so that the distance a $b-x$ has added to it an expansion equal to x . In other words, the contraction of the mold compensates exactly for the expansion during the process of curving the electrotype to fit the particular rotary cylinder of the printing press for which it is designed.

If printing plates for a flat bed press are de-

sired, the curving operation illustrated in Fig. 4 is not carried out, in which event the other process steps are carried out in the usual manner, and the printing surface of the finished electrotype corresponds to the printing surface of the original pattern.

While I refer in connection with illustrating the process step shown in Fig. 4, to securing the backing plate of the mold to the curved plate 5 by soldering, other methods of clamping or bolting the mold to the plate may be employed without departing from the scope of my invention. It makes no difference how I curve the mold illustrated in Fig. 3, as long as the extent of curvature prior to electroplating compensates for the expansion which will occur when the finished electrotype is curved to accommodate the printing cylinder of a rotary press.

It should further be understood that the preparation of curved molds such as I have described, is new, regardless of the manner in which such molds may be curved, and the cathodic surface thereof contracted to compensate for subsequent expansion.

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

1. In the manufacture of electrotypes the steps which include molding an impression on a flat case, concavely curving the molded case to a predetermined arc of curvature and then electroplating the thus curved molded case forming thereon a thin electrotype shell, removing the electrotype shell, backing up said shell with a flat soft metal backing and then curving the combined shell and backing in the opposite direction to a curvature substantially equivalent to the original predetermined arc of curvature.

2. In the manufacture of electrotypes the steps which include molding an impression on a flat case of substantial thickness and thereafter concavely curving the molded case in such direction with respect to the impressed surface as to contract the surface of the impressed face of the case, electroplating the curved molded case to form a thin electrotype, removing the electrotype and thereafter backing the electrotype and curving the backed electrotype to conform to the contour of a printing cylinder, said curving being in such direction as to expand the surface of the electrotype to correspond to the original molded impression.

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