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PROCESS OF FORMING A PRINTING ELEMENT

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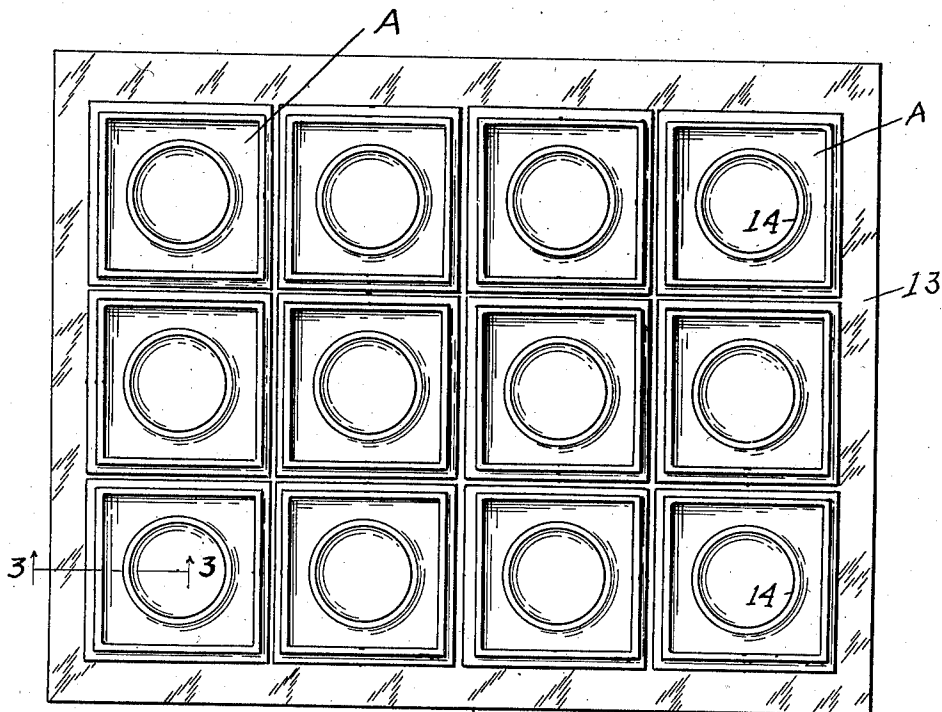


FIG. 1.

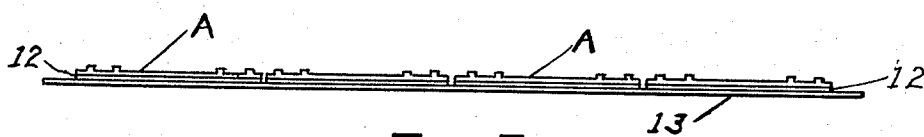


FIG. 2.

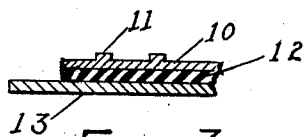


FIG. 3.

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PROCESS OF FORMING A PRINTING
ELEMENT

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Application September 20, 1937, Serial No. 164,721

1 Claim. (Cl. 101—379)

This invention relates to improvements in process of forming a printing element.

In the present day methods of using electrotypes in relief presses, much time is consumed in "make-ready" operation, that is, in underlaying and overlaying the electrotype plates to get the printing surfaces of all at the same level to thereby obtain proper impressions on the sheets. Particularly is the time consumed in make-ready relatively great in those cases requiring many duplicates, for instance, where forms are made for 16 or 32 page books. This difficulty in bringing the surfaces of all of the electrotypes to the same printing level is due primarily to the fact that, in making the electrotypes with the usual metal backs, it is exceedingly difficult to make all of the electrotypes of exactly the same thickness. With such electrotype metal backs (composed principally of lead) it is obvious that there is no resiliency of the electrotype under printing pressure and hence the necessity of underlaying or overlaying.

One object of this invention is to provide relief printing elements having electrotype, electrodeposited, photo-engraved and etched in relief or otherwise produced, thin metal printing shells of such character that, notwithstanding tolerated variations in thicknesses in final condition of a number of such printing elements, a number of the same may be assembled on a form in a great deal less time for make-ready than present day electrotypes and proper impressions obtained therefrom.

Another object of the invention is to provide a relief printing element having an electrodeposited, photo-engraved and etched in relief or otherwise produced, thin metal surface printing shell and a yieldable, resilient or compressible back of material such as rubber therefor, whereby limited variations in thickness of the completed printing elements may be compensated for, during the taking of impressions, by the yielding or compression of the printing element back.

As is well known to those skilled in the art, electrotypes and other relief metal printing blocks now in use, are not available for mounting on cylinders of type presses for the reason that the present day electrotypes and other relief metal printing elements are not suitable or adaptable for such purposes.

Another object of the invention, therefore, is to provide electrodeposited, photo-engraved and etched in relief or otherwise produced thin metal shell relief printing elements of such character

that the same may be readily flexed, without injury or distortion, sufficiently to adapt the same for mounting on cylinders of type presses and in offset presses.

More specifically, an object of the invention is to provide electrodeposited, photo-engraved and etched in relief or otherwise produced thin and flexible metal shell relief printing elements having readily flexible backs of material such as rubber, whereby the printing elements may, in turn, be mounted on a flexible sheet metal base plate and the thus composed press plate wrapped around a cylinder of a type press or around the plate cylinder of an offset press for dry offset printing.

A further object of the invention is to provide an improved process for producing individual printing elements and composed press plate printing elements of the character indicated in the preceding objects of invention.

Other objects of the invention will more clearly appear from the description and claim hereinafter following.

In the drawing forming a part of this specification, Figure 1 is a plan view of a composed press plate or form illustrating the invention. Figure 2 is an edge elevational view of the press plate or printing form shown in Figure 1. And Figure 3 is a detail sectional view, upon an enlarged scale, corresponding substantially to the line 3—3 of Figure 1.

In carrying out the present invention, each individual printing element comprises a thin and flexible metal shell having the matter to be printed formed in relief on one surface thereof and a yieldable and flexible back fixedly secured thereto. The metal relief printing shells, per se, may be made in any desired manner, as for instance, electrolytically in the usual manner as in an electrolytic bath or by photo-engraving process etched in relief. It is essential that the metal relief printing shell be thin and reasonably flexible and to that end, whether made electrolytically or otherwise, is preferably kept within the range of .008" to .012" in thickness, according to job requirements. If desired, such shells if made of copper or other relatively soft metal, may be faced or topped with nickel or other hard plating metal to provide a relief printing shell of longer life. A portion of a shell, having the foregoing characteristics, is indicated at 10 in Figure 3 where the textual or pictorial matter or both is conventionally indicated in relief at 11—11. As will be understood by those skilled in the art, the relief printing shells herein re-

ferred to are such as commonly known in the art as electrotypes, wherein the electrotpe or relief printing shell has incorporated thereon all of the letters of the textual matter that may be employed, or the entire design or combination of textual matter and design so that all of the letters of the textual matter or the entire design or the combination thereof are united by a common metallic shell and maintained in such relation at all times throughout a printing operation.

When the thin relief printing shells are completed, (by whatever process), the same then have applied thereto a back of resilient or compressible material, preferably rubber, in sheet form of suitable thickness for the class of work for which the elements are to be used. As clear from the drawing, each of the resilient or compressible backs 12 is made co-extensive in area with its corresponding shell 10. The printing shells and resilient flexible backs are preferably secured together in a hydraulic press by first coating both the rubber back with cement and also the rear side of the shell, and then placing the two together and applying pressure when in the hydraulic press so as to insure thorough adhesion between the back and printing shell. A portion of such a rubber back is indicated at 12 in Figure 3.

When a form is to be made up either of a plurality of like printing elements or differing elements, the same are "composed" or mounted on a flexible base plate, preferably a sheet metal flexible plate such as indicated at 13 in the drawing. In Figures 1 and 2 of the drawing, twelve of such individual printing elements, each comprised of a thin, inherently flexible metal relief printing shell and resilient back, are shown, such complete printing elements, per se, being indicated by the reference character A—A and on each of which is indicated conventionally an image, design or the like in relief at 14. While each of the printing elements A, as shown in Figure 1, are conventionally illustrated as having the same design or image, it will be understood that the printing elements which are used to make up the complete press plate or printing form may carry different designs, images or textual matter and some may be half tones or line cuts or type matter or combinations thereof.

In applying the individual elements A to the flexible base plate 13, it will ordinarily be necessary to apply the elements in predetermined position and location and for that purpose the method described in my copending application No. 158,088, filed August 9, 1937, for improvement in Method and means for composing relief printing plates, is preferably employed. The in-

dividual printing elements A are secured to the base plate 13 by cementing the resilient backs 12 of the elements A to the plate 13, pressure being also preferably employed during this step, as set forth in said copending application.

With a printing element having a thin metal relief printing surface shell and a compressible back, as described, it is obvious that a plurality of such elements, whether of like or different subjects, may be placed in a form and the time of make-ready reduced to a minimum since any slight differences that may exist in the height of the relief surfaces of such printing elements will be automatically compensated for by compression of the backs when the form is under the usual pressure incident to the taking of an impression. It is further evident that printing elements of the type disclosed having a thin metallic shell and a flexible back may readily be flexed without injury to the printing elements or distortion of the relief image printing surfaces so that, when a number of such elements are composed on a press plate as shown, the thus composed press plate may be wrapped around the cylinder of a relief printing press or around the plate cylinder of an offset press for printing dry offset.

Although there has herein been shown and described what is now considered the preferred manner of carrying out the invention, the same is merely illustrative and all changes and modifications are contemplated that come within the scope of the claim appended hereto.

What is claimed is:

The process of preparing a composed printing form for cylinder presses, which consists in preparing a plurality of printing elements each of which has a thin, inherently flexible metal shell with a metal printing face in relief; fixedly securing, under pressure, a separate, resilient, compressible and flexible back directly to the back of each of said flexible metal shells; and then securing, by an adhesive and under pressure, the said several, individually flexible and resiliently backed printing element shells by imposition according to a predetermined layout, to a single flexible sheet metal base plate adapted to be wrapped around a printing press cylinder whereby to insure relative registration of the several individual composite printing elements on said base plate and in respect to the final printing form and to likewise insure, by means of the several individually flexible, resilient and compressibly backed composite printing elements, obtaining the desired printing pressure by each of said composite printing elements.

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