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METHOD OF PRODUCING COPYING PAPER

Filed Dec. 22, 1926

Fig. 1

Fig. 2

Fig. 3

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The well-known copying-papers (so-called carbon papers) are provided with a layer of copying-ink, that is a substance containing one or more dyes finely and uniformly distributed in wax, or a mixture of waxes, oils, fats, and in some cases wax-like substances. This substance is solid at ordinary temperatures, and, therefore, does not smear. When it is applied to paper it is melted by heating in a bath from which it is then taken up by a rotating cylindrical dipper, the paper being unwound from a roll and drawn over the dipper. As the rotary speeds of the dipper and the paper are not alike, the ink is actually spread onto the paper. Subsequently, the paper is conducted over rollers which distribute the coat of ink uniformly and remove the excess ink. In order to keep the ink liquid, the dipper and the last-mentioned rollers must be heated. After the coat of ink has become uniform, the paper is conducted over a water-cooled cylinder for the purpose of rapidly solidifying the ink. The process of applying the ink is now finished.

Copying-papers made by this method are very impractical when used for filling out blank forms of which copies are to be taken, and they are wholly unadapted, if the text on the original is to be reproduced in part only. Whereas copying-papers manufactured by the spreading-process can only produce copies agreeing in every respect with the original, it is often desirable, as for instance when the copying system is used in banks, to copy only certain parts of the original. The blank forms are sometimes bound together in blocks which are interleaved with copying-paper. This entails expense, and the removal of the filled-in forms is impeded by the copying-paper. Therefore, one has provided the reverse side of the blank forms themselves with a coat of copying-ink which, however, according to the above mentioned process of spreading, must always result in covering the whole surface, and unless the paper is thick the copying-ink penetrates tending to make the blank forms illegible and difficult to fill in. An alternative method is to print slowly drying printing-ink on to the back of such portions of the blank forms as are to be filled in. Printing-ink however contains the pigment uniformly and finely distributed in a varnish, or mixture of fats, and is of a pasty consistency at ordinary temperatures. It smudges if not completely dry, and the coat on the back of the blank forms does the same, soil ing the hands. Copying ink of this description is usually typographically applied, and its efficacy in copying depends directly on the degree to which it smudges.

Now, according to the present invention, copying-ink, such as is used for the so-called carbon paper, is applied to the paper by an ink roller having the same circumferential speed as the paper. This can conveniently be effected, as in printing, on a rotary press. The speeds of the rotating ink-roller and the paper are equalized by passing the paper from a roll or in sheets between the ink-roller and a roller exerting a counter-pressure. Experience has shown that copying-ink when thus applied does not penetrate the paper ordinarily used for blank forms. The process according to the present invention enables the application of copying-ink to be restricted to the back of such portions of the blank forms as are to be filled out. When copying ink is applied by the spreading process, above referred to, only strips parallel to the length of the paper can be left free of ink. It has been shown by experience, that forms provided with a coat of copying-ink according to this invention, are in no way inferior to ordinary copying-papers (carbon papers). The copies are equally legible, and the number of copies that can be taken when filling in the original blank form is equally large. The blank forms can be bound together to form a block, or be portions of a suitable folded sheet.

The drawing shows in Figs. 1 and 2 the front and reverse sides of a sample blank form made according to the invention. Fig. 3 shows, as an example of the apparatus for making the blank forms, a rotary press for printing blank forms which is adapted for applying a coat of copying-ink to the reverse sides of the blank forms. The description of this press, will also serve as an illustrative example of the process embodying the invention.

The blank form as shown in Figs. 1 and 2 is printed on the front side, leaving space for entries to be made by hand or typewriter. The reverse side has the portions corresponding to those to be filled in, provided with a coat of copying ink. If while being filled in, the blank form is superimposed on another similarly printed one, a copy is obtained that is in all respects true to the original. If sev-
eral forms possessing a coat of copying-ink be laid on a blank form printed only, several copies are obtained when the top blank form is filled in. If a copy is not to contain all the matter on the original on the blank form lying above the coat of copying-ink is omitted from those portions corresponding to the entries to be omitted.

In the machine shown in Fig. 3, the paper, a, while being unwound from the roll not shown, is conducted over the printing roller b (which carries the stereotype plate for printing the blank forms) and is pressed against said roller by the counter-pressure roller c. The paper now passes over the numbering rollers d and e, the longitudinal perforator f, and the transverse perforator g. It continues without interruption over the guide roller h of the inking apparatus and is conducted between the coating roller k and the counter-pressure roller i. The paper finally passes over the cooling cylinder t, a second guide roller k, and then over the cutters l and m to the collecting table n. The copying-ink is taken from the bath o (which is equipped with a heating arrangement not shown) by the dipping roller p and transferred to the distributing roller q which even out the film of ink and then passes it on to the coating roller k. The dipping roller and the distributing roller q are mounted on levers which can be adjusted by the pressure-screws r. In this way the clearance between the dipping roller and the distributing roller on the one hand, and that between the distributing roller and the coating roller on the other hand can be varied, and the thickness of the film of copying-ink thereby regulated. The four rollers p, q, k and t are equipped with heating tubes through which a heating agent, such as steam, can be passed. The cooling cylinder t has an arrangement for water-cooling not shown in the drawing.

The surface of the coating roller k can be so designed that no copying-ink is taken from the distributing roller except in the areas that correspond to the reverse side of such portions of the blank forms as are to be written on. The portions of the roller that are to remain free from copying-ink can, for instance, be hollowed out thus leaving the inking areas raised or the inverse system can be adopted if the roller works on the intaglio principle.

It is evident that several devices for applying copying-ink can be installed on the same machine and that these can produce variously coloured coatings of copying-ink:

What I claim is:

1. The method of coating paper with a copying ink such as used in the manufacture of carbon paper, which consists in applying the ink, hard at ordinary temperature, to the paper by a printing roller, while moving the paper at the same speed as the printing roller, and restricting the coating to separated well-defined portions.

2. The method of coating paper with a copying ink such as used in the manufacture of carbon paper, which consists in applying the ink, hard at ordinary temperature, to the paper by a printing roller, while moving the paper at the same speed as the printing roller, and restricting the coating to longitudinally and transversely separated well-defined portions.

3. The method of producing printed blank forms provided with a coating of copying ink such as used in the manufacture of carbon paper, which consists in applying the ink, hard at ordinary temperature, by a printing roller to a continuous paper web, while moving said paper web at the same speed as the printing roller, and restricting the coating to separated well-defined portions.

4. The method of producing printed blank forms provided with a coating of copying ink such as used in the manufacture of carbon paper, which consists in applying the ink, hard at ordinary temperature, by a printing roller to a continuous paper web, while moving said paper web at the same speed as the printing roller, and restricting the coating to longitudinally and transversely separated well-defined portions.

5. The method of producing printed blank forms provided with a coating of copying ink such as used in the manufacture of carbon paper, which consists in applying the ink, hard at ordinary temperature, by a printing roller to said paper web, while moving said web at the same speed as the printing roller, restricting the coating to separated well-defined portions, and then severing said paper web into sections of the desired lengths.

In testimony whereof I have affixed my signature.

Dr. ERNST HODLER.