Oct. 1, 1940. A. MARCHEV 2,216,594

DUPLICATING DEVICE AND A METHOD OF PRODUCING IT

Filed June 23, 1938

Fig. 3.

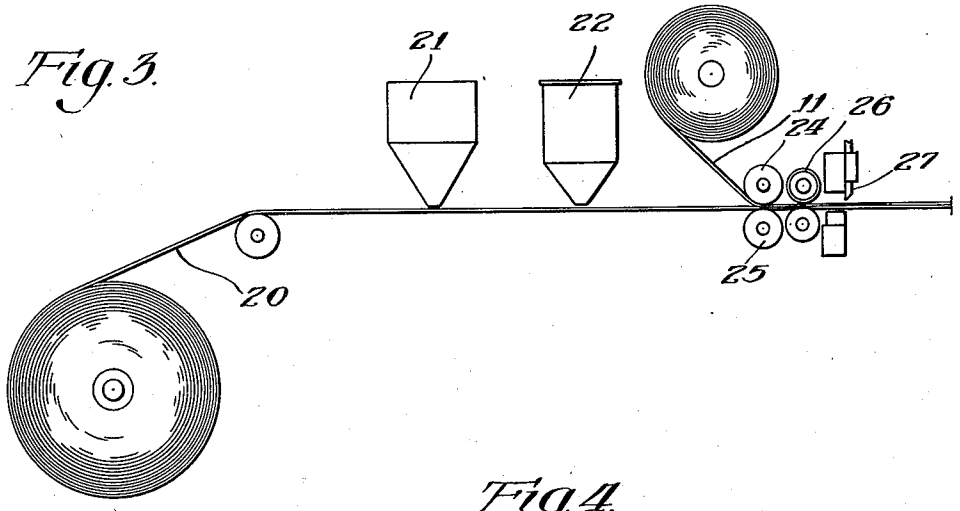


Fig. 4.

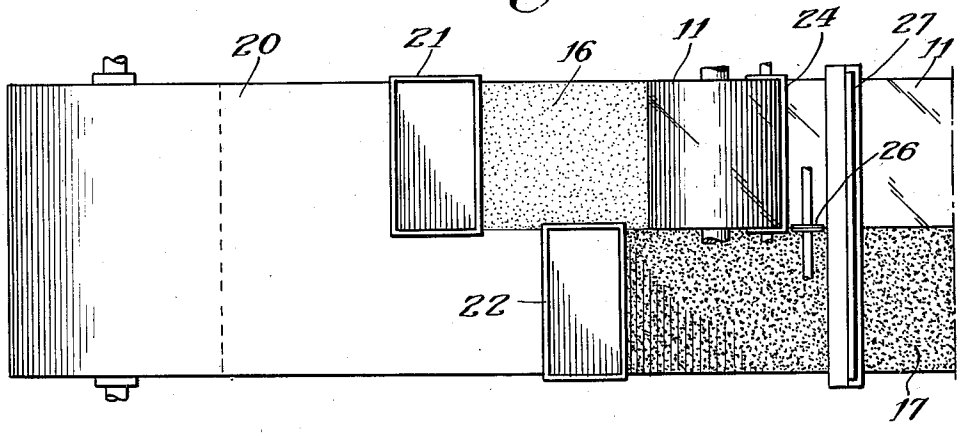


Fig. 1.

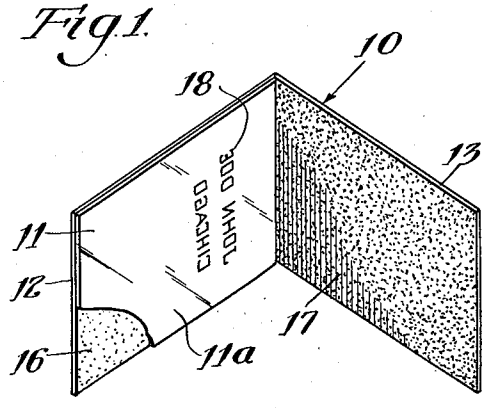
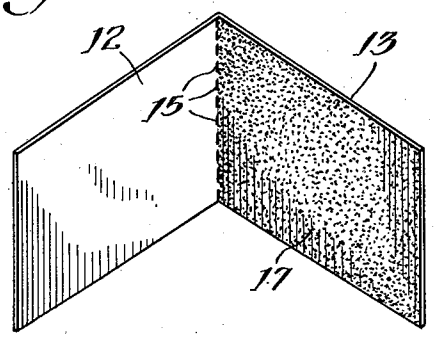


Fig. 2.



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DUPLICATING DEVICE AND A METHOD OF PRODUCING IT

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Application June 23, 1938, Serial No. 215,358

5 Claims. (Cl. 101—401.1)

The invention relates to duplicating devices and a method of producing them and has for its primary object the provision of an improved duplicating or printing device and an improved method of producing them.

A preferred form of the invention is embodied in a duplicating or printing device of the planographic type, which duplicating or printing device preferably comprises a thin flexible metallic sheet having a sandblasted surface upon which the data to be duplicated is typewritten or otherwise marked, in ink or material to which ink will adhere readily. The thin metallic sheet is backed by a sheet of paper which is secured to the metallic sheet by a suitable adhesive. The paper backing sheet has an extension adapted to cover the sandblasted surface of the metallic sheet, the extended portion of the paper sheet being coated with the ink or material with which the data to be duplicated are formed upon the sandblasted surface.

The preferred method of producing the duplicating or printing devices described above is to advance a sheet or ribbon of paper continuously and to apply adhesive and the ink or other material performing data to be duplicated to the sheet or ribbon of paper. While the sheet or ribbon is being advanced, aluminum foil is applied to the part of the paper which has been coated with the adhesive. The sheet or ribbon of paper with the foil adhering thereto may then be cut into suitable lengths, whereupon the improved duplicating or printing devices are ready for use.

Other objects and advantages will become apparent as the following detailed description progresses, reference being had to the accompanying drawing, wherein—

Fig. 1 is a perspective view, partly broken away, of a duplicating or printing device which embodies the invention.

Fig. 2 is a perspective view of a paper backing which forms part of the device shown in Fig. 1.

Fig. 3 is a diagrammatic view illustrating the improved method for forming the improved devices shown in Fig. 1, and

Fig. 4 is a somewhat diagrammatic plan elevation of the apparatus shown in Fig. 3.

Referring for the present to Fig. 1 wherein a preferred embodiment of the invention is illustrated in the form of a flexible planographic printing plate, the reference character 10 designates the improved device in general. The duplicating or printing device 10 preferably comprises a metallic sheet or foil 11 provided with a paper backing 12 which has an extension or flap portion 13 preferably having the same dimensions as the metallic sheet or foil 11 as far as length and width are concerned. The backing sheet 12, with its extension or flap portion 13, is shown in Fig. 2 and it will be noted that it is preferably perforated or scored as at 15 substantially midway between its ends to facilitate the folding thereof and to enable the operator to tear the extension or flap portion 13 from the assembly 10.

The metallic sheet or foil 11 is preferably formed of aluminum which is approximately 0.0005 of an inch thick, the paper backing 12 being preferably about 0.0025 of an inch thick. The paper backing 12 has a coating 16 of adhesive which causes the paper backing to adhere to the foil 11. The inner surface of the extension or flap portion 13 is provided with a coating 17 formed of a transfer material, the transfer material being one to which water-repellent ink will readily adhere. The transfer material is preferably of the type described in the co-pending application, Serial No. 188,706 filed February 4, 1938, by Johan Bjorksten and William J. Champion. The coating is applied to the flap portion 13 in such manner that the flap portion may be folded to bring the coating 17 against the exposed surface of the foil 11. The exposed surface of the foil 11 is designated by the reference character 11*a* and is grained. In practice, good results have been obtained by sandblasting the surface 11*a*. It will be readily understood that when water or other ink-repellent liquid is applied to the surface 11*a*, it will disperse thereover readily by capillary action.

To prepare the printing or duplicating device 10 for duplicating operations, the flap portion 13 is folded to have the coating 17 contact the grained surface 11*a*. One may then write upon the outer surface of the backing sheet 12 with a stylus, or the equivalent, and the data to be duplicated will be formed upon the grained surface 11*a*. The coating 17 may or may not have pigments therein that make the data visible upon the surface 11*a*. The data are shown at 18 for the purpose of this disclosure and it will be noted that they are in reverse. Of course, if the data is typed on the flap portion 13, the data to be duplicated will not be in reverse. This may be desirable in some instances.

After the data 18 have been formed upon the surface 11*a*, the flap portion 13 may be torn from the remainder of the device 10 and water or other

ink-repellent liquid may be applied to the surface 11a. Ink may then be applied to the data 18 by running an inking roller thereover. If a copy sheet is then pressed against the surface 11a, the data 18 will be duplicated in positive upon the copy sheet. The copy sheet may then be removed and the ink-repellent liquid may be applied again to the surface 11a and the data 18 may be re-inked after which another copy sheet may be pressed against the surface 11a to obtain a duplicate in positive of the data 18.

It will be readily understood that the folded duplicating device 10 may be inserted in a typewriter and the data 18 may be formed on the surface 11a by typing against the outer surface of the flap portion 13 so that the data will be formed in negative upon the surface 11a.

The foil 11, with its backing sheet 12, is relatively flexible and may be employed as a printing plate in apparatus of the type shown and described in the co-pending application, Serial No. 207,730, filed May 13, 1938, by Alfred Marchev and Morris P. Neal.

In Figs. 3 and 4 the preferred method of forming the printing or duplicating device 10 is illustrated. The paper backing 12 of the improved duplicating or printing device 10 is formed by advancing a ribbon or web 20 of paper adjacent an adhesive applying apparatus 21 and a transfer material applying apparatus 22 in such manner that half of the advancing web 20 is coated with adhesive 16 and the other half is coated with transfer material 17, the second half extending longitudinally of the web as best illustrated in Fig. 4. The apparatus 21 and 22 are illustrated diagrammatically as the details of construction thereof do not form a part of the present invention. The foil 11 is withdrawn from a roll thereof and is applied to the adhesive coated portion of the web 20 by rollers 24 and 25. A suitable wheel 26 is provided for scoring or perforating the web 20 along the line at which the coatings 16 and 17 meet each other longitudinally of the web. The advancing assembly of web 20 and foil 11 is cut into suitable lengths by means comprising a knife 27 which operates intermittently. Suitable mechanism (not shown) is provided for advancing the web 20 and the foil 11 and for actuating the wheel 26 and the cutting mechanism which comprises the blade 27. The details of the driving mechanism do not form a part of this invention. Obviously, when the assembled web and foil has been cut into suitable lengths, it is only necessary to fold the flap portion 13 of the backing sheet 12 so that the coating 17 will contact the surfaces 11a, it being understood that the foil 11 has one side thereof sandblasted before it is applied to the web 20.

I claim:

1. A duplicating device comprising a flexible metallic sheet having a surface upon which data to be duplicated may be formed, a backing sheet adhering to said metallic sheet on its surface opposite the first-mentioned surface, and an extension of said backing sheet having a coating thereon adapted to contact the first-mentioned surface to protect the same and from which the data to be duplicated may be formed.

2. A duplicating device comprising a flexible metallic sheet having a surface upon which data to be duplicated may be formed, a backing sheet adhering to said metallic sheet on its surface opposite the first-mentioned surface, and an extension of said backing sheet forming a protective covering for said metallic sheet and having a coating thereon adapted to contact the first-mentioned surface and from which the data to be duplicated may be formed, said extension being scored or perforated at its line of juncture with the main portion of the backing sheet whereby said extension may be detached readily from the metallic sheet.

3. A method of forming printing or duplicating devices, which method comprises continuously advancing a web of paper, coating half of it longitudinally with adhesive and the other half of it longitudinally with a transfer medium as the web advances, applying metallic foil to that portion of the moving web coated with adhesive, and cutting the assembled foil and web into sections transversely of the web as it is advanced.

4. A method of forming printing or duplicating devices, which method comprises continuously advancing a web of paper, coating a portion of it longitudinally with adhesive and another portion of it longitudinally with a transfer medium as the web advances, applying metallic foil to that portion of the moving web coated with adhesive, cutting the assembled foil and web into sections transversely of the web as it is advanced, and folding the web portions to have the transfer medium contact the foil.

5. A duplicating unit adapted for conditioning for use without any change in the relative position of the elements thereof, comprising a metallic sheet, one surface of which is adapted to be conditioned for use in a duplicating device, a protective sheet overlying said metallic sheet, and a coating on said protective sheet adjacent said metallic surface, portions of said coating being adapted to be transferred to said metallic surface only when said portions are urged into contact with said metallic sheet by a pressure greater than a predetermined minimum pressure, whereby said surface is conditioned for use in duplicating, said protective sheet being detachably secured to said metallic sheet at one edge thereof.

ALFRED MARCHEV.