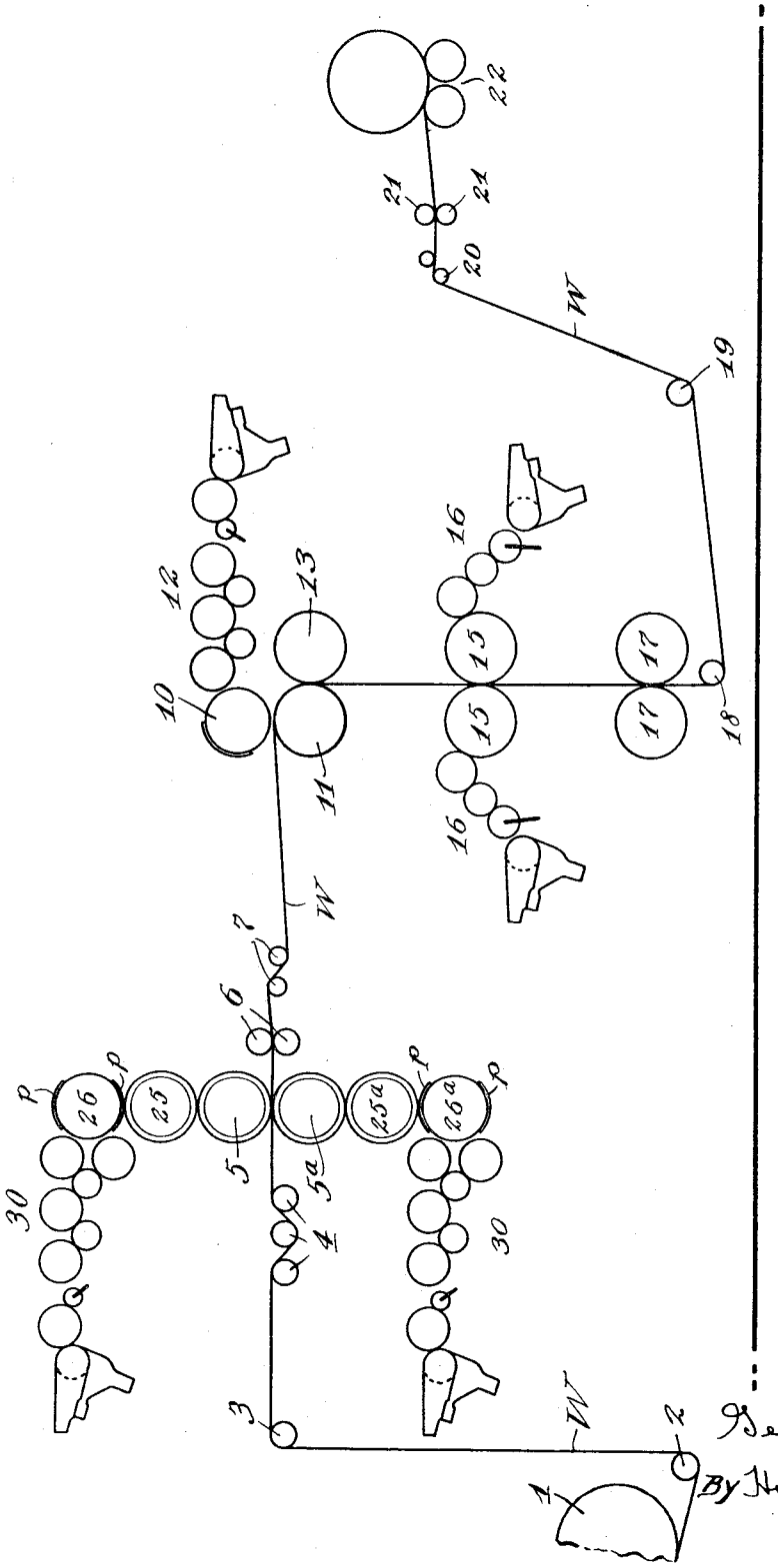
Oct. 18, 1927. 1,646,034

G. A. MAYER

PRINTING APPARATUS

Filed June 6, 1925




Inventor
George A. Mayer
By Hull, Brock & West
Attys.

Patented Oct. 18, 1927. 1,646,034

# UNITED STATES PATENT OFFICE.

GEORGE A. MAYER, OF LAKEWOOD, OHIO, ASSIGNOR TO THE MANIFOLD COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

## PRINTING APPARATUS.

Application filed June 6, 1925. Serial No. 35,293.

The primary purpose of this invention is the production of apparatus for printing and numbering manifold continuous forms in an efficient, economical, and highly satisfactory manner.

A further object is to arrange the printing and transfer cylinders of the apparatus in such position that they are readily accessible from a convenient location at all times.

In the drawing accompanying and forming a part hereof the figure is a diagrammatic representation of a printing apparatus embodying the invention, and wherein the above mentioned objects are attained.

Manifold continuous forms of the kind produced by the apparatus herein disclosed are shown in United States Letters Patent No. 1,509,525, issued September 23, 1924. Briefly, in the printing of forms of this character, the printed matter of each form is repeated longitudinally of the web, and each form, being ultimately made up of superposed connected sheets bearing duplicate copies, is repeated transversely of the web a number of times corresponding to the number of sheets which go to make up the completed article. Adjacent sheets are printed on opposite sides of the web so that when subsequently fan folded, the printed matter of all sheets faces in the same direction. Such forms are so well known that further detail description is deemed unnecessary. It may be added, however, that usually the web of paper is perforated transversely between adjacent forms of sets of forms, and longitudinally between the adjacent sheets of the respective forms. Also, as brought out in the aforesaid Letters Patent, certain or all of the sheets of each form are punched for filing devices or loose leaf binders.

With reference to the apparatus represented by the diagram of the drawing, a web W of receiving material, such as paper, is drawn from a supply roll 1, over guides 2 and 3 through so called infeed rolls 4, between two cylinders designated 5 and 5ª which constitute parts of my improved printing couples. The web is carried thence between out-feed rolls 6 and compensating rolls 7 to a printing couple comprised of a plate cylinder 10 and a tympan or impression cylinder 11, the former cylinder having associated with it the usual inking mechanism 12. Besides the plate cylinder 10 which cooperates with the impression cylinder 11, there is a cross perforation cylinder 13 which perforates the web transversely. The web passes from the impression cylinder 11 between numbering heads 15 which are equipped with inking mechanisms 16. The numbering heads are of usual construction and function automatically to successively number the forms as the web is fed between them. The web next passes between punching rolls 17 which perforate the sheets of the forms for loose leaf binders or filing posts and from thence the web is carried about guides 18, 19 and 20 and between perforating rolls 21 that perforate the web longitudinally, to rewind mechanism designated 22.

The previously mentioned cylinders 5 and 5ª are combined transfer and impression cylinders. Each is an impression cylinder in the sense of sustaining the web for the reception of an impression from the other cylinder and each is a transfer cylinder in the sense that it carries from the cylinder contacting with it an impression to the web. Cooperating with the respective cylinders 5 and 5ª are cylinders 25 and 25ª. All of these cylinders are preferably rubber jacketed and are commonly known as blanket cylinders. Cooperating with the cylinders 25 and 25ª are what I shall term type cylinders 26 and 26ª, respectively. I employ the term "type" in its broadest sense. As a matter of fact the type are preferably in the nature of plates precisely like those used in rotary presses for direct printing and are made by the same process. They are distinguished from offset printing plates by the fact that their printing surfaces are in relief. Each of the cylinders 26 and 26ª is provided with inking mechanism 30.

It will be understood that the various cylinders, rolls, inking mechanisms, etc. are geared together according to the usual practice, so that the printing, numbering, perforating and punching cylinders will travel at the same surface speed.

The type cylinders 26 and 26ª are shown as carrying diametrically opposed type plates *p*, and upon each rotation of the cylinder, said plates receive ink from the mechanism 30 and transfer it, according to the printed matter or designs on the plates, to the cylinders 25 and 25ª, and these cylinders

in turn impress it upon the cylinders 5 and 5ª which impress it upon the opposite sides of the web W. As the web continues on its way it passes through the printing couple comprised of the cylinders 10 and 11 where a color may be laid on the web, and from thence the web passes between the numbering heads 15 where the forms are consecutively numbered.

It will be observed that the type and transfer cylinders are arranged in a vertical line and that the inking mechanism for both type cylinders are disposed on the same side of the respective printing couples. From the other side the type and transfer cylinders may be readily reached for inspection purposes at any time.

Having thus described my invention, what I claim is:—

In printing apparatus, the combination of two combined impression and transfer cylinders between which a continuous web of material is adapted to be fed, said cylinders simultaneously contacting with the opposite sides of the web on the same transverse line, means for positively feeding the web at the surface speed of said cylinders immediately in advance of and beyond the line of contact between said cylinders and the web, two transfer cylinders, one cooperating with each of the first mentioned cylinders, two printing cylinders, one associated with each of the second mentioned cylinders, a relief type plate bearing a form composition carried by each of the printing cylinders, inking mechanism for each of the printing cylinders, and numbering mechanism to which the web is subjected for serially numbering the forms impressed thereon.

In testimony whereof, I hereunto affix my signature.

GEORGE A. MAYER.