To all whom it may concern:

Be it known that I, William L. Hamilton, of the United States, and resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Cylinders for Rotary Printing-Presses, of which the following is a specification and which are illustrated in the accompanying drawings, forming part thereof:

The invention relates to the cylinders of rotary printing presses and particularly to those of the form shown in my patent for rotary printing press, No. 1,008,737, dated September 19, 1911, wherein each cylinder has printing and impression surfaces of different radius. In such printing presses the tympan surface of each cylinder is of less radius than the printing surface thereby permitting the tympan surface to pass the form rollers.

The present invention has for its object to provide a printing cylinder of the type described, which shall be easily manufactured and shall be effective in operation.

In the accompanying drawings—Figure 1 is a detail central longitudinal sectional view of a rotary printing press showing cylinders of the form provided by the invention, and, Fig. 2 is a perspective view of one of the cylinders.

The printing press illustrated in Fig. 1 of the drawings comprises the two feed boards 10 and 11, the two cylinders 12 and 13 and the two sets of form rollers 14 and 15.

In constructing the press a sheet delivery mechanism of the form illustrated in my said patent No. 1,008,737 will preferably be employed, but it has been deemed unnecessary to show this herein.

The two cylinders 12, 13 are preferably of like construction, each being in part a printing cylinder and in part a tympan cylinder. The printing portion of each cylinder is indicated at 16 and the tympan portion at 17. In the operation of the press the two cylinders roll together, the printing portion 16 of one cylinder cooperating with the tympan portion 17 of the other cylinder.

For this purpose the two cylinders are provided with intermeshing gears, one of which is shown at 18.

In order that the tympan portion 17 of each of the cylinders 12, 13 may pass the corresponding set of form rollers 14, 15 without being engaged thereby, the cylinders are so constructed that when the tympan portion 17 is covered with the usual packing 19 and the printing portion 16 is supplied with printing plates 20 the effective radius of the tympan portion 17 is less than that of the printing portion 16. This arrangement requires that the intermeshing cylinder gears as 18 shall be of irregular outline, their pitch lines following the irregular effective contour of the cylinders, whereby the cylinders are rotated at relatively variable angular velocity, and the surface speeds of the printing plate on each cylinder is uniform with the surface speed on the tympan of the other cylinder when said surfaces are in contact, all as fully disclosed in my said patent No. 1,008,737.

In carrying out the present invention the body portion of each of the cylinders 12, 13 is made of uniform radius throughout its circumference and the difference in the effective radius of the printing and the impression portions is obtained by the use of the printing plates 20 and packing 19 which are of different thickness, the packing 19 preferably being the thinner. As shown the part 16 of each of the cylinders 12, 13 is provided with oblique slots 21 for receiving plate fastening hooks 22. These plate fastening hooks may be of any usual form of construction. They are accordingly not illustrated in detail in the drawings. The part 17 of the body portion of each of the cylinders 12, 13 is preferably made smooth for reception of the packing 19. The usual tympan reels 23 are provided upon each cylinder adjacent to part 17 for stretching the packing 19 and grippers 24 are provided for holding the sheets to be printed against the packing.

In the operation of the press, sheets to be printed are fed alternately from the two feed boards 10, 11, each sheet being fed to the grippers 24 of the corresponding cylinder 12, 13. The printing plates 20 upon the printing portion 16 of each cylinder are supplied with ink as they pass beneath the corresponding set of form rollers 14, 15 and then print a sheet against the tympan portion 17 of the other cylinder. The packing 19 passes beneath the corresponding set of form rollers 14, 15 without being engaged thereby, by reason of its being of less thick-
ness than are the printing plates 20. It has been found by experiment that if printing plates 3/16 of an inch in thickness are employed, packing of the usual thickness of about 25/1000 of an inch may be employed without being engaged by the form rollers 14, 15, while still permitting the two parts of the cylinder body against which the plates 20 and packing 19 are respectively held to be of the same radius. By means of this arrangement the body portions of the cylinders 12, 13 may be finished in a lathe without the necessity of moving the finishing tool back and forth as it comes into engagement with the two parts of the cylinder.

I claim as my invention:

1. A printing device comprising a cylindrical body having a surface of uniform radius throughout and a part of such surface being constructed for the reception of a printing plate and a different part of such surface being constructed for the reception of a tympan, the said printing plate and tympan to be superposed upon the respective portions of the cylindrical body and each increasing the effective radius of the said part of the body to which it is applied but in different amounts.

2. A printing device comprising a cylindrical body having a surface of uniform radius throughout, and a printing plate and tympan of different thickness superposed upon different parts of the cylindrical surface of the said body.

3. In a rotary printing press, in combination, a pair of equal parallel cylinders each having its surface conforming to a true circle, a printing plate superposed upon a part of each cylinder, a tympan superposed upon a different part of each cylinder, the two printing plates and the two tympans being each of like thickness but the thickness of the tympans and printing plates being unequal, and means for rotating the cylinders at relatively variable angular velocity whereby the surface speeds of the printing plate and tympan on each cylinder will alternately be uniform with the surface speeds of the tympan and printing plate on the other cylinder respectively.

4. In combination, a pair of oppositely rotating cylinders each having a surface of uniform radius throughout, a part of the surface of each cylinder being constructed for the reception of a printing plate and a different part of the surface of each cylinder being adapted to serve as a tympan, the printing plates to be superposed upon the said parts of the two cylinders for increasing the effective radii of the surfaces to which they are respectively applied beyond the effective radii of the said parts which are adapted to serve as tympans, and the printing plate which is applied to each cylinder coacting with the said part of the other cylinder which is adapted to serve as a tympan.

5. A printing device comprising a cylindrical body having a surface of uniform radius throughout, and a part of such surface being constructed for the reception of a printing plate and a different part of such surface being constructed for the reception of a tympan, the said printing plate and tympan to be superposed upon the respective portions of the cylindrical body and each increasing the effective radius of the said part of the body to which it is applied but in different amounts, and means for rotating the cylindrical body at different speeds which are relatively in the same proportion as the effective radii of the said two parts of the body.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."