

Jan. 12, 1937.

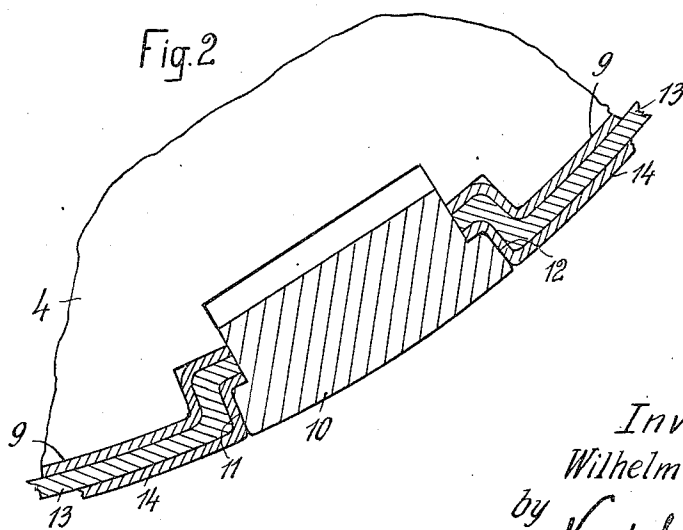
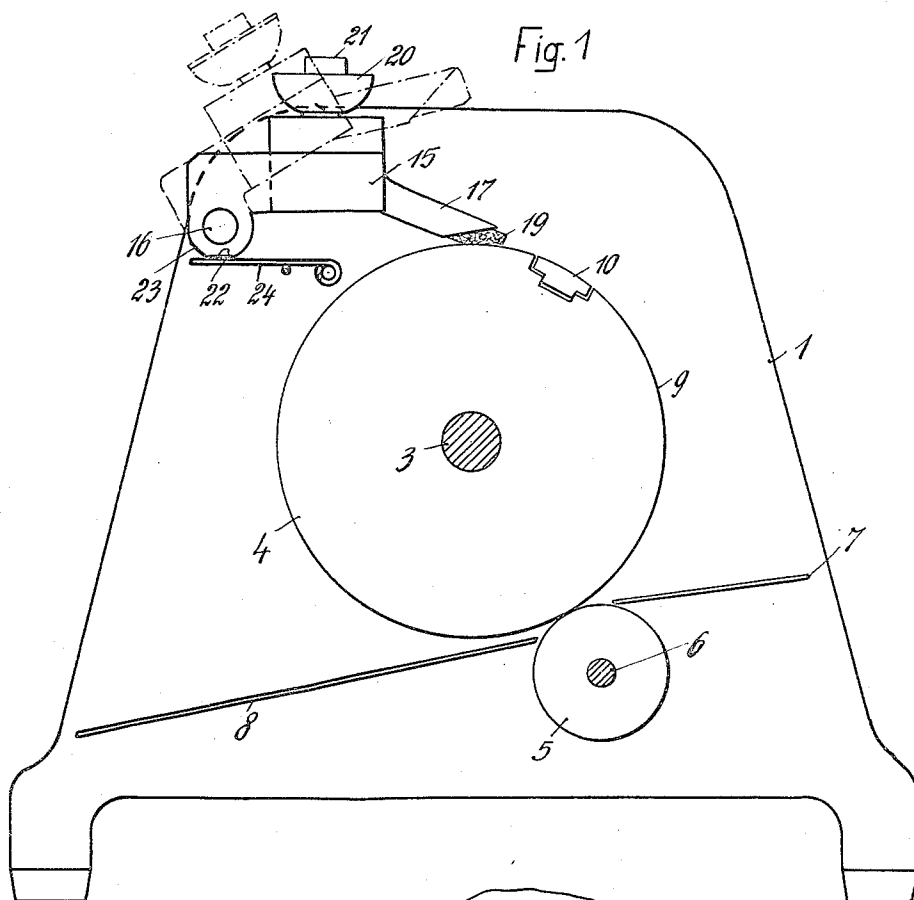
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2,067,289

APPARATUS FOR MULTIPLYING RECORDS

Filed Jan. 5, 1934

3 Sheets-Sheet 1



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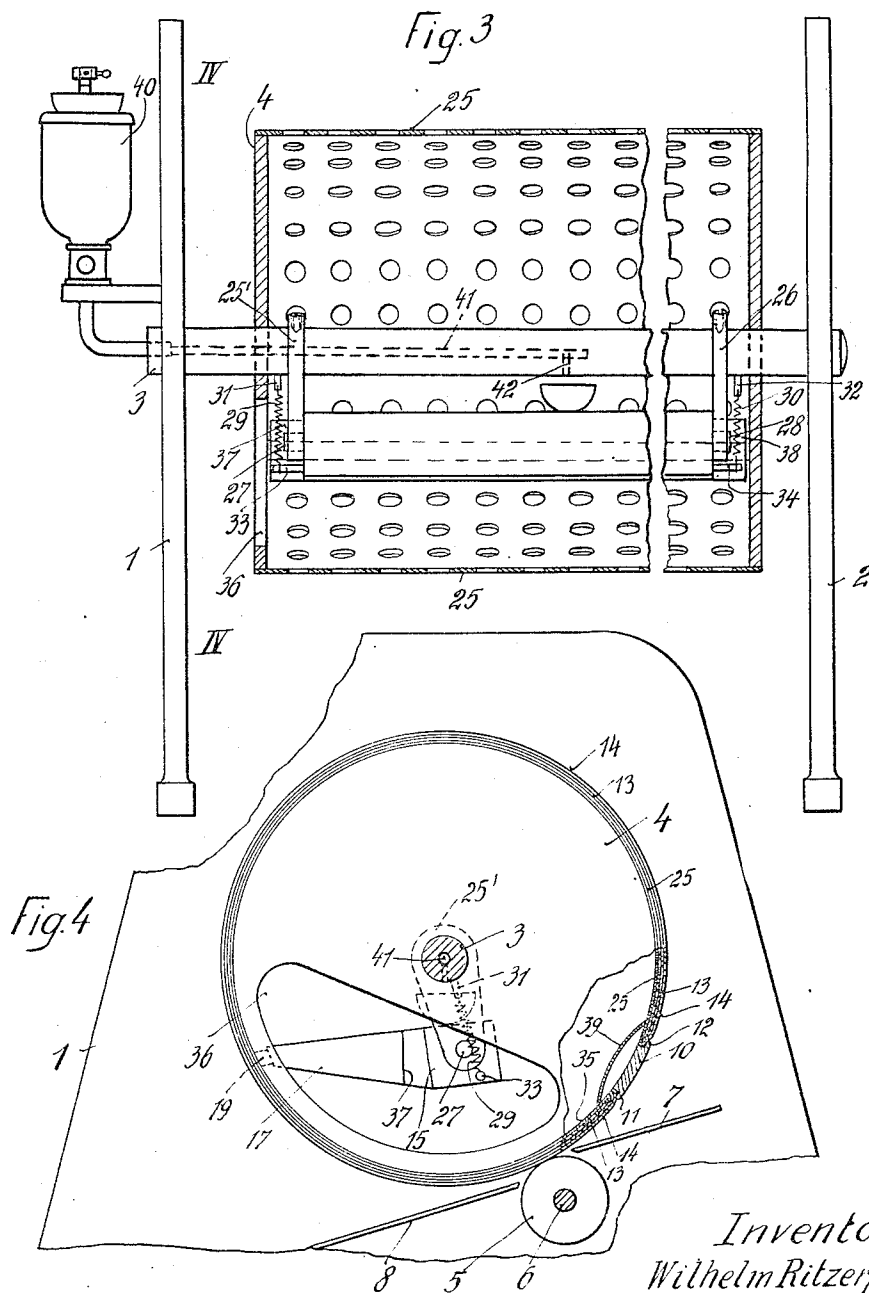
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2,067,289

APPARATUS FOR MULTIPLYING RECORDS

Filed Jan. 5, 1934

3 Sheets-Sheet 2



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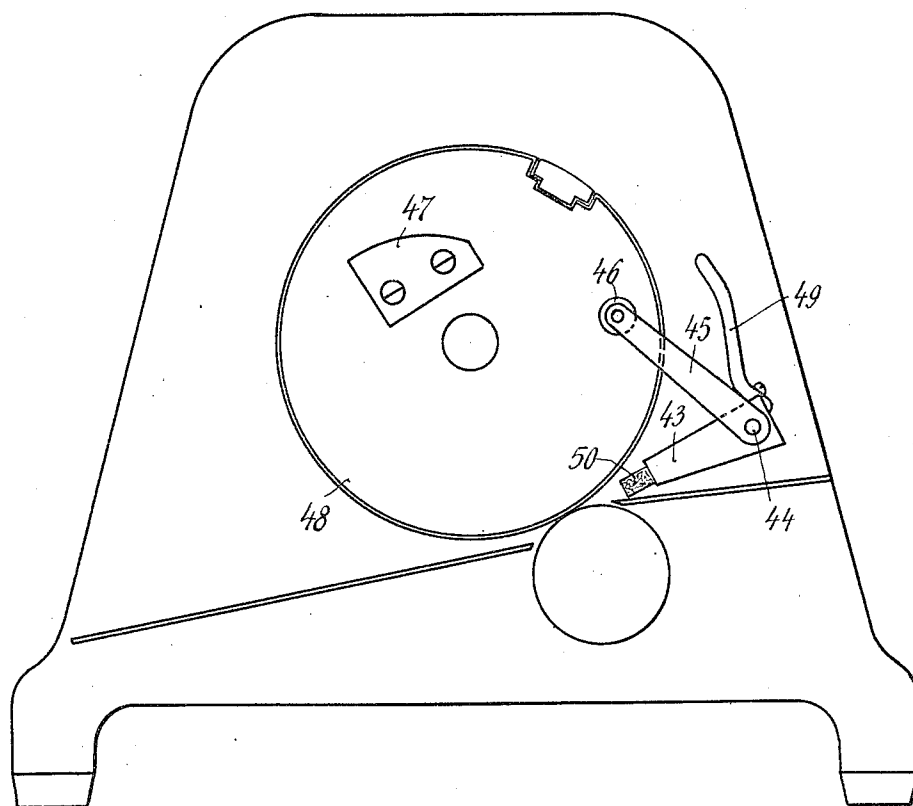
2,067,289

APPARATUS FOR MULTIPLYING RECORDS

Filed Jan. 5, 1934

3 Sheets-Sheet 3

Fig. 5



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UNITED STATES PATENT OFFICE

2,067,289

APPARATUS FOR MULTIPLYING RECORDS

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Application January 5, 1934, Serial No. 705,381
In Germany September 29, 1932

3 Claims. (Cl. 101—132)

My invention relates to apparatus for multiplying records for instance such as are printed or written in mirror script.

Heretofore as described in the specification of my patent of the United States No. 1,645,930, it was necessary to moisten the sheets to be printed upon by means of damping rollers. The problem of multiplying originals on which a record is made in copying ink, by printing them on dry (unmoistened) sheets by first moistening the original from the rear, has not yet been satisfactorily solved because suitable means for moistening the original from the rear and for obtaining good and clear copies therefrom on dry sheets, have not yet been suggested.

It is an object of my invention to improve an apparatus of the kind referred to. To this end I provide a liquid-absorbing pad which may be moistened or impregnated with a suitable liquid, and on this pad I place the original with its record-bearing face uppermost. I am thus enabled to print on dry sheets from the original.

The pad may be made of any suitable material, such as cloth, linen, felt or the like. It is secured on a suitable printing platen, preferably by means of the clamping device which also serves to secure the original in place. Alternatively it may be pasted or otherwise attached to the platen. The platen may be a flat plate, but I prefer using a printing cylinder which is lined with the pad. The original is secured on the pad with its record-bearing face uppermost and the dry sheets are applied against the original by an impression roller and are printed from the original by rotation of the cylinder and the roller.

The liquid for moistening the original is preferably stored in a reservoir which may be applied against the pad manually or by mechanical means such as springs or the like.

By rotating the printing cylinder with respect to the reservoir the pad is impregnated with the liquid and in turn moistens the original from the rear side after the original has been placed on the pad. The reservoir is preferably supplied with liquid from a metering tank so that the supply can be regulated.

The reservoir may be arranged outside of or within the (hollow) printing cylinder. If the reservoir is arranged within the cylinder, the latter is provided with a perforated barrel so that the liquid from the reservoir is admitted to the pad through the perforations of the barrel. Penetration of the liquid into the pad is facilitated if the inner face of the pad engaging the

barrel is made of a soft, fibrous and compressible material, such as plush, velours or the like, the fibres of which fill up the perforations in the barrel and project inwardly therethrough, so that they are accessible to the liquid which they receive and deliver to the pad.

If desired, I may provide a layer of porous material on the inner side of the barrel which layer receives the liquid from the reservoir and delivers it to the pad on the outer side. The pad and the inner layer may be made of the same material, or of two different materials.

The reservoir for the liquid is preferably mounted to oscillate outside of or within the cylinder and is arranged to be held in two positions by springs or the like. In its inactive position the nozzle of the reservoir is moved clear of the pad. It may be moved into its active position in which its spout or nozzle bears on the pad or layer, either manually or by suitable mechanical means such as a lever or the like, which are well known in the art and need not be described in detail.

Instead of being mounted to oscillate in the manner described, so as to form an integral member of the apparatus, the reservoir may be an independent unit which may be applied against the pad by hand if it is desired to impregnate this latter, while the platen or cylinder is displaced or rotated with respect to the reservoir.

In order to more effectively dissolve the ink of the record on the original, means well known in the transfer process may be provided for moistening or damping the sheets, as described in my said prior patent. Instead of providing separate means for moistening or damping the sheets, I may so design or arrange the above-mentioned reservoir, that it delivers its liquid to the printing cylinder and to the sheet-moistening means. The moistening of the sheets may be effected throughout the operation or it may be started after a certain number of sheets have been printed in dry condition.

In the drawings affixed to this specification and forming part thereof two forms of an apparatus embodying my invention are illustrated diagrammatically by way of example.

In the drawings

Fig. 1 is a partly sectional end elevation of an apparatus whose liquid reservoir is arranged outside of the printing cylinder,

Fig. 2 being a transverse section of the printing cylinder showing its clamping device, drawn to a larger scale.

Fig. 3 is a partly sectional side elevation of an

apparatus in which the reservoir is arranged within the hollow printing cylinder, and

Fig. 4 is a section on the line IV—IV in Fig. 3.

Fig. 5 is a similar view of another modification.

Referring now to the drawings, 1 and 2 are two end plates of the frame in which the shaft 3 of a printing cylinder 4 is mounted. The shaft 3 may be mounted to rotate in the end plates 1 and 2, or it may be fixed so that the printing cylinder 4 rotates about the fixed shaft. The means for rotating the shaft 3 or the cylinder 4, as the case may be, will not be shown and described as they may be of any suitable type. 5 is an impression roller on a shaft 6 which is adapted to cooperate with the printing cylinder 4. The sheets to be printed are supplied to the gap between the printing cylinder 4 and the impression roller 5 on a chute or table 7 in the direction of the arrow in Fig. 1, and the printed sheets are ejected on a chute or table 8 at the opposite side of the gap.

Referring now to Fig. 2, the barrel 9 of the printing cylinder 4 is slotted or depressed for the reception of a clamping rail 10 which is mounted to be displaced radially in the recess or depression of the cylinder 4. Any suitable means (not shown) may be provided for displacing the rail 10. The clamping rail 10 has a pair of shoulders 11 and 12 at opposite sides. 13 is the pad and 14 is the original. Both the pad and the original are held in the slot or depression of the printing cylinder by the two shoulders 11 and 12 of the rail 10. This way of securing the pad 13 and the original 14 at the same time is preferred, but, as mentioned, the pad may be pasted, screwed, or otherwise attached to the barrel 9.

Referring now to Fig. 1, a liquid reservoir 15 is mounted to rock about pivots 16 between the two end plates 1 and 2 of the frame above the printing cylinder 4. The liquid reservoir is a box or casing of substantially rectangular cross section, with a nozzle 17 extending toward the cylinder 4, and a strip 18 of felt or the like by which the open end of the nozzle is plugged. A filling cup 20 is placed on top of the reservoir and closed by a plug 21.

One of the bearings which support the reservoir 15 on the corresponding pivot 16, is provided with flat faces 22 and 23 and a spring 24 for engaging the faces. The faces are arranged at an angle of about 45 degs. to each other, and, in the position illustrated in full lines in Fig. 1, the spring 24 engages the face 22. When the reservoir 15 is moved into the position shown in dot-and-dash lines, the spring 24 bears on the face 23 and holds the reservoir in this position. In the active position shown in full lines, the reaction of the spring 24 applies the strip 19 against the pad 13 and the pad is moistened.

Obviously, the spring 24 and the faces 22 and 23 might be duplicated at the other side of the frame. As mentioned mechanism (not shown) of any suitable kind may be provided for operating the reservoir.

While in the apparatus illustrated in Figs. 1 and 2 the shaft 1 or the printing cylinder 4 may be mounted to rotate, the shaft 3 must be fixed in the apparatus illustrated in Figs. 3 and 4 which will now be described. While in the apparatus illustrated in Figs. 1 and 2, the printing cylinder 4 has a plain barrel 9, the barrel 25 is perforated in the other apparatus, and the pad 13 is secured on its outer side. Both the pad 13 and the original 14 are held by the clamping device 10. Arms 25' and 26 are secured on the sta-

tionary shaft 3 and the liquid reservoir 15 which is similar to that illustrated in Figs. 1 and 2, is mounted to oscillate about pivots 27 and 28 on the free ends of the arms 25' and 26. Springs 29 and 30 are attached to the shaft 13 at 31 and 32, respectively. The free ends of the springs are connected to pins 33 and 34, respectively, on the reservoir 15.

The free end or nozzle 17 of the reservoir 15 is plugged by a strip 19 of felt or the like, as described above. The pins 33, 34 to which the free ends of the springs 29, 30 are attached, are so arranged with respect to the pivots 27 and 28 of the reservoir 15 that in the active position illustrated in Fig. 4, the pins 33 and 34 are at the right of the pivots 27 and 28 so that the pull of the springs tends to turn the reservoir 15 in the direction of the arrow at the right and the strip 19 is held against the inner side of the barrel 25 by the springs 29 and 30. In the example illustrated, the porous layer 35 referred to is placed on the inner side of the barrel 25 opposite the pad 13 so that the liquid from the reservoir which penetrates through the strip 19 is absorbed by the layer 35 and passed on to the pad 13 through the perforations of the barrel 25. The end wall of the cylinder 4 at the left has an opening 36 through which the reservoir 15 is accessible. If it is desired to move the reservoir into its inactive position, the operator turns it about its pivots 27 and 28 in upward direction, as indicated by the arrow at the left in Fig. 4. The pins 33 and 34 of the springs 31 and 32 now move to the left of the pivots 27 and 28 and turn the reservoir 15 in upward direction until checks 37 and 38 on the reservoir strike the corresponding arms 25' and 26. In this position, the reservoir is held by the reaction of the springs 31 and 32 until it is pulled back into the active position, Fig. 4. In the active position, the reaction of the springs 31 and 32 holds the strip 19 at the nozzle of the reservoir against the layer 35 or, if the layer is dispensed with, directly against the barrel 25 of the printing cylinder 4.

In order to prevent interference of the strip 19 with the clamping device 10, the device is concealed by a bridge 39 so that the strip 19 moves smoothly across the device as the cylinder 4 rotates.

40 is a tank for the liquid to be supplied to the reservoir 15. This tank which is preferably a metering tank and is equipped with suitable regulating means, is connected to an axial bore 41 in the shaft 3 by a pipe 17. A radial bore 42 extends toward the filling cup 20 on the reservoir 15.

In the modified form of a machine illustrated in Fig. 5 the reservoir for the moistening liquid is mounted on a spindle 44 governed by an arm 45 and roller 46 extending into the path of a cam face 47 on the printing cylinder 48. In the position shown in the drawings the moistening strip 50 projecting from the reservoir deposits a film of liquid on the fresh sheets introduced into the machine, whereupon it is lifted by the cam 47 passing below the roller 46 and applied automatically against the pad on the cylinder, which is thus supplied with liquid in its turn. The handle 49 enables the strip to be applied manually against the pad.

The reservoir is preferably filled with porous material such as felt, cotton wool, or the like, and the strip in the nozzle of the reservoir may be replaced by a brush (not shown).

I wish it to be understood that I do not de-

sire to be limited to the exact details of construction shown and described for obvious modifications will occur to a person skilled in the art.

5 In the claims affixed to this specification no selection of any particular modification of the invention is intended to the exclusion of other modifications thereof and the right to subsequently make claim to any modification not covered by these claims is expressly reserved.

10 I claim:—

1. An apparatus for multiplying records comprising a printing cylinder, a pad on said cylinder, means for moistening said pad, an impression roller adapted to cooperate with said cylinder and means for moistening the sheets to be printed upon.

2. An apparatus for multiplying records comprising a printing cylinder, a pad on said cylinder, moistening means oscillatably mounted in front of said cylinder and means for alternately applying said moistening means against said cylinder and against a copying sheet about to enter the machine.

3. An apparatus for multiplying records comprising a printing cylinder, a pad on said cylinder, moistening means oscillatably mounted in front of said cylinder and automatically active means for alternately applying said moistening means against said cylinder and against a copying sheet about to enter the machine.

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