Aug. 25, 1936. W. RITZERFELD 2,051,897

MANIFOLDING APPARATUS FOR PRINTING FROM MIRROR SCRIPT ORIGINALS ON PREMOISTENED SHEETS OR THE LIKE

Filed Oct. 30, 1934

Fig. 1.

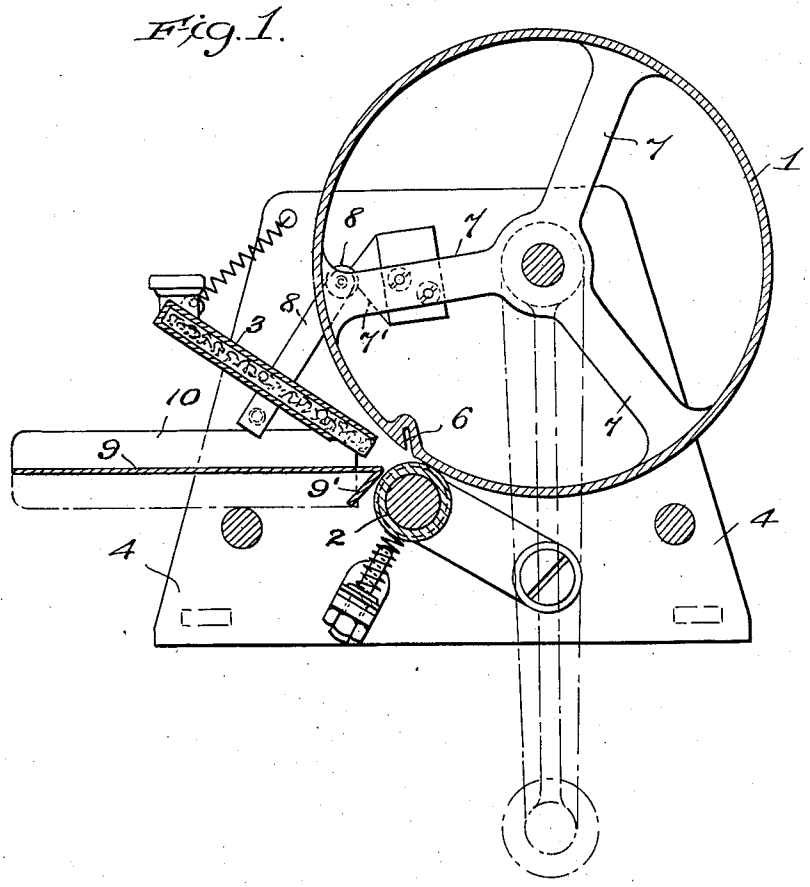
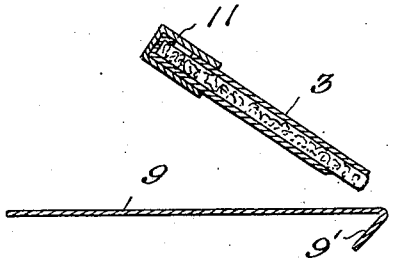


Fig. 2.



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Patented Aug. 25, 1936

2,051,897

UNITED STATES PATENT OFFICE

2,051,897

MANIFOLDING APPARATUS FOR PRINTING FROM MIRROR SCRIPT ORIGINALS ON PREMOISTENED SHEETS OR THE LIKE

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Application October 30, 1934, Serial No. 750,612
In Germany November 10, 1933

8 Claims. (Cl. 101—132)

The invention relates to an improvement and a simplification of manifolding apparatus in which is printed from mirror script original on to sheets or the like previously evanescently moistened with a readily volatile liquid.

Manifolding apparatus of this kind were already proposed, but they were too complicated as for construction and too expensive for use in little hotels, clubs, offices or the like. Small and cheap manifolding apparatus of good and reliable construction were not yet on the market.

This want for an apparatus is fulfilled by the present invention which shows a very simple and cheap construction.

The principal feature of the apparatus according to the invention is given by the fact, that the least number of parts or element available is used for all necessary work to be done. This is effectuated by combining the functions of several parts or elements of the former apparatus in one part in the new apparatus. Therefore a great number of parts used formerly can be avoided and the whole machine is much more simplified and therefore much cheaper.

The apparatus consists—just as the previous models, of one impressing drum for the original written in mirror script, one counter pressing roller and a pivoted moistening device fastened before them. By this moistening device the sheet to be printed on is covered with a film of a volatile liquid, suitable to dissolve the script on the original.

The printing drum consists of a hollow drum as it is already known and is stiffened by one or more crossing bars. According to the invention one of these parts is placed in such a manner, relatively to the mounting device for the original, that it may serve as support for a cam shaped surface which lowers the moistening device to the sheet to be printed on in the moment, in which it is passing through between the impressing drum and the counter pressing roller.

Whilst the apparatus formerly known had a special device for holding the impressing drum in the initial position, the above mentioned cam shaped surface attached to the stiffening bar of the impressing drum fulfills also this task, and fixes the impressing drum in its initial position, that means the position the apparatus must show when sheets to be printed on are fed in. Furthermore the position of the impressing drum with the original fixed on it must be such one that the original and the sheet must cover one another entirely. For this purpose the reinforcing bar or spoke of the printing cylinder and the cam-shaped surface secured thereto have to be located in such relation to the clamping device that the apparatus is caused to stop at the proper initial position. A further simplification and diminution of the means for mounting the original on the impressing drum is provided too. The impressing drum previously used had a special clamping device for the original. According to this contrivance the impressing drum and clamping device consist only of one part. The hollow drum therefore in its interior is furnished with a bulb extending in cross direction. On its surface it shows a slit or recess in order to receive the original to be mounted thereon.

The relative position of the clamping means on the printing cylinder and of the cam-shaped member mounted on a spoke of said cylinder, which controls the moistening device and determines the initial position of the apparatus, is such that the clear sheets are introduced and pressed against the copyable original in the correct position. The slit for fixing the original is very narrow and cut prone and in forward direction into the impressing drum. By this device an easy and reliable fixing of the paper is assured. Furthermore the slit in the reinforced portion of the printing cylinder is of such depth that it is capable of taking up the leading edge of the original corresponding to the upper marginal portion of the copy sheet which is to remain clear.

Furthermore the moistening device controlled by the above mentioned cam shaped surface is simplified and all the functions of several parts of those moistening devices used before, are reduced. The moistening device according to this contrivance is formed of one piece and entirely closed except the opening for the moistening felt.

A special fluid container and special tubes for leading the liquid as they were used at the former apparatus are not provided; it shows only one or several openings for an immediate moistening of the felt. Furthermore it is furnished with a control lever working together with the above mentioned cam shaped surface attached to the drum stiffening bar. The point, around which the control lever is pivoting, in the meantime is also the bearing for the moistening device. Furthermore at the opening or the openings of the moistening device little boxes are attached which represent a little fluid container as well as a closing device for the openings. By this device the former fluid container which was separated from the moistener has been replaced. These little boxes are

to be opened in order to equalize the air pressure inside and outside after a certain quantity of liquid has passed through. The shape of the openings may be of any suitable form.

If these small liquid boxes are not applied a slit provided in longitudinal direction of the upper edge of the moistener may be provided and may be closed by a narrow U-shaped metal strip, or the like.

Furthermore the laying-on table for the sheets to be printed on is essentially simplified and by its provided shape it fulfills the function of several parts. As it is very important that the feeding table should have a completely even and rigid surface in order to permit the provision of an even and uniform coating of solvent on the clear sheet by means of the moistening device, in prior duplicating machines a separate reinforcing rail has been provided for the feeding table. In addition to being rather complicated and expensive, this arrangement also had the inconvenience that often the feed table proper and the reinforcing rail incorporated therein did not have exactly the same height so that frequently the clear sheets introduced into the apparatus abutted against the reinforcing rail. According to the principles of the present invention this inconvenience is eliminated by reinforcing the feeding table by bending back its front marginal portion, which is directed towards the bight of the printing cylinder and the counter pressure roller. Instead of prior paper guides which have been merely bolted laterally to the table, a simple and accurate guide is provided which is integral with the table proper and is obtained by punching out a strip of metal therefrom on three sides and bending it up vertically along the fourth side. Thus, a simple, inexpensive and efficient feeding table is provided.

In the drawing one example of the apparatus according to the invention is shown.

Fig. 1 shows a cross-section of the whole device and Fig. 2 shows another modification of the moistening container.

The impressing drum 1, the counter pressing roller 2 and the moistening container 3 are provided in a frame 4. In the impressing drum 1 is a longitudinal slit or recess 6, into which the original is placed with its front edge. The impressing drum 1 carries on its sides one or more bars or arms 7, of which the one shows a cam shaped surface 7'. The lever 8 attached to the moistener, of which the pivot serves as pivot for the moistener too, travels on the curve 7' in such a manner that the moistener is lifted up after each turn of the impressing drum 1.

Furthermore curve 7' shows a recess or depression into which meshes a little roller 8', attached to the free end of the controlling lever 8. By this contrivance impressing drum 1 is kept in its initial position. The counter pressing roller 2 is rotatably mounted in the swivelling arms 5 and is pressed against the impressing drum 1 by spring force. The laying-on table 9 is bent downward at 9'. The guiding bar 10 is punched out of the laying-on table.

Fig. 2 illustrates a modified embodiment of the moistening device according to the invention. In this embodiment the container 3 holding the moistening felt is provided with a longitudinal slit on the upper portion thereof for introducing the moistening liquid. The slit may be closed by slipping U-shaped member 11 on the container.

I claim:

1. In a duplicating apparatus printing onto clear sheets previously moistened with a rapidly volatilizing solvent, the combination comprising a rotatable printing cylinder having a single, integrally formed narrow recess on its surface extending parallel to the axis of said cylinder and at an obtuse angle to the surface thereof, said recess having relatively sharp edges and being capable of receiving and holding the folded back leading edge of a sheet of paper bearing a copyable mirror-script original, a moistening means for moistening said clear sheets with said rapidly volatilizing solvent, and a pressure roller co-operating with said printing cylinder for pressing a clear sheet against said original.

2. In a duplicating apparatus printing onto clear sheets previously moistened with a rapidly volatilizing solvent, the combination comprising a rotatable and hollow printing cylinder, an axially extending reinforced portion on the inner surface of said cylinder, a single, integrally formed narrow recess having relatively sharp edges within said reinforced portion forming an obtuse angle with the surface of said cylinder and being capable of receiving and holding the folded back leading edge of a sheet of paper bearing copyable mirror-script original, a moistening means for moistening said clear sheets with said rapidly volatilizing solvent, and a pressure roller co-operating with said printing cylinder for pressing a clear sheet against said original.

3. In a duplicating apparatus printing onto clear sheets previously moistened with a rapidly volatilizing solvent, the combination comprising a rotatable and hollow printing cylinder, a plurality of spokes associated with said cylinder, a shaft having a crank at one end rigidly connected to the said spokes, an axially extending reinforced portion on the inner surface of said cylinder, a single, integrally formed narrow recess having relatively sharp edges within said reinforced portion forming an obtuse angle with the surface of said cylinder and being capable of receiving and holding the folded back leading edge of a sheet of paper bearing copyable mirror-script original, a moistening means for moistening said clear sheets with said rapidly volatilizing solvent, and a pressure roller co-operating with said printing cylinder for pressing a clear sheet against said original.

4. In a duplicating apparatus printing onto clear sheets previously moistened with a rapidly volatilizing solvent, the combination comprising a rotatable and hollow printing cylinder, a plurality of spokes associated with said cylinder, a shaft having a crank at one end rigidly connected to the said spokes, an axially extending reinforced portion on the inner surface of said cylinder, a single, integrally formed narrow recess having relatively sharp edges within said reinforced portion being capable of receiving and holding the folded back leading edge of a sheet of paper bearing copyable mirror-script original, a pivoted moistening device mounted on an operating lever, a cam-like surface mounted on one of said spokes adapted to co-operate with said operating lever for moving said moistening device into and out of operative position, and a pressure roller for pressing a clear sheet against said copyable original.

5. In a duplicating apparatus printing onto clear sheets previously moistened with a rapidly volatilizing solvent, the combination comprising a rotatable and hollow printing cylinder, a plu-

rality of spokes associated with said cylinder, a shaft having a crank at one end rigidly connected to said spokes, a counter pressure roller co-operating with said cylinder, an axially extending reinforced portion on the inner surface of said cylinder, a single, integrally formed narrow recess having relatively sharp edges within said reinforced portion being capable of receiving and holding the folded back leading edge of a sheet of paper bearing copyable mirror-script original, a moistening device mounted on a pivoted operating lever, a cam-like surface having a depression mounted on one of said spokes and adapted to co-operate with a roller at the end of said operating lever whereby said moistening device will be moved out of operative position when said roller is engaging said cam surface and said printing cylinder will be stopped in its initial position when said roller enters said depression on said cam surface.

6. In a duplicating apparatus printing onto clear sheets previously moistened with a rapidly volatilizing solvent, the combination comprising a machine frame, a hollow printing cylinder having spokes and a shaft rotatably mounted in said frame, a spring-held counter pressure roller co-operating with said printing cylinder, a single, integrally formed narrow and axially extending recess having relatively sharp edges on the surface of said printing cylinder capable of receiving and holding the folded back leading edge of a sheet of paper bearing copyable mirror-script original, a pivoted moistening device including a quadrangular container, a moistening felt in said container having one of its ends protruding therefrom, an opening on the upper part of said container, a closable small liquid tank inserted in said opening to feed liquid to said moistening felt, and cam-like means on one of the spokes of said printing cylinder for moving said moistening device into and out of operative position.

7. In a duplicating apparatus printing onto clear sheets previously moistened with a rapidly volatilizing solvent, the combination comprising a machine frame, a hollow printing cylinder having spokes and a shaft rotatably mounted in said frame, a spring-held counter pressure roller co-operating with said printing cylinder, a single, integrally formed narrow and axially extending recess having relatively sharp edges on the surface of said printing cylinder capable of receiving and holding the folded back leading edge of a sheet of paper bearing copyable mirror-script original, a pivoted moistening device including a quadrangular container, a moistening felt in said container having its lower end protruding therefrom, a slit on the upper portion of said container, a U-shaped member for covering said slit, and cam-like means associated with said printing cylinder for controlling said pivoted moistening device.

8. In a duplicating apparatus printing onto clear sheets previously moistened with a rapidly volatilizing solvent, the combination comprising a machine frame, a hollow printing cylinder rotatably mounted in said frame, a spring-held counter pressure roller co-operating with said printing cylinder, a single, integrally formed narrow and axially extending recess having relatively sharp edges on the surface of said printing cylinder capable of receiving and holding the folded back leading edge of a sheet of paper bearing copyable mirror-script original, a feeding table mounted in said frame and having its front edge reinforced by means of bending back a portion thereof, a paper guide integrally formed with said feeding table by punching out and bending upwards a portion thereof, a moistening means pivoted on said feeding table, and cam-like means associated with said printing cylinder to move said moistening means into and out of operative position.

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