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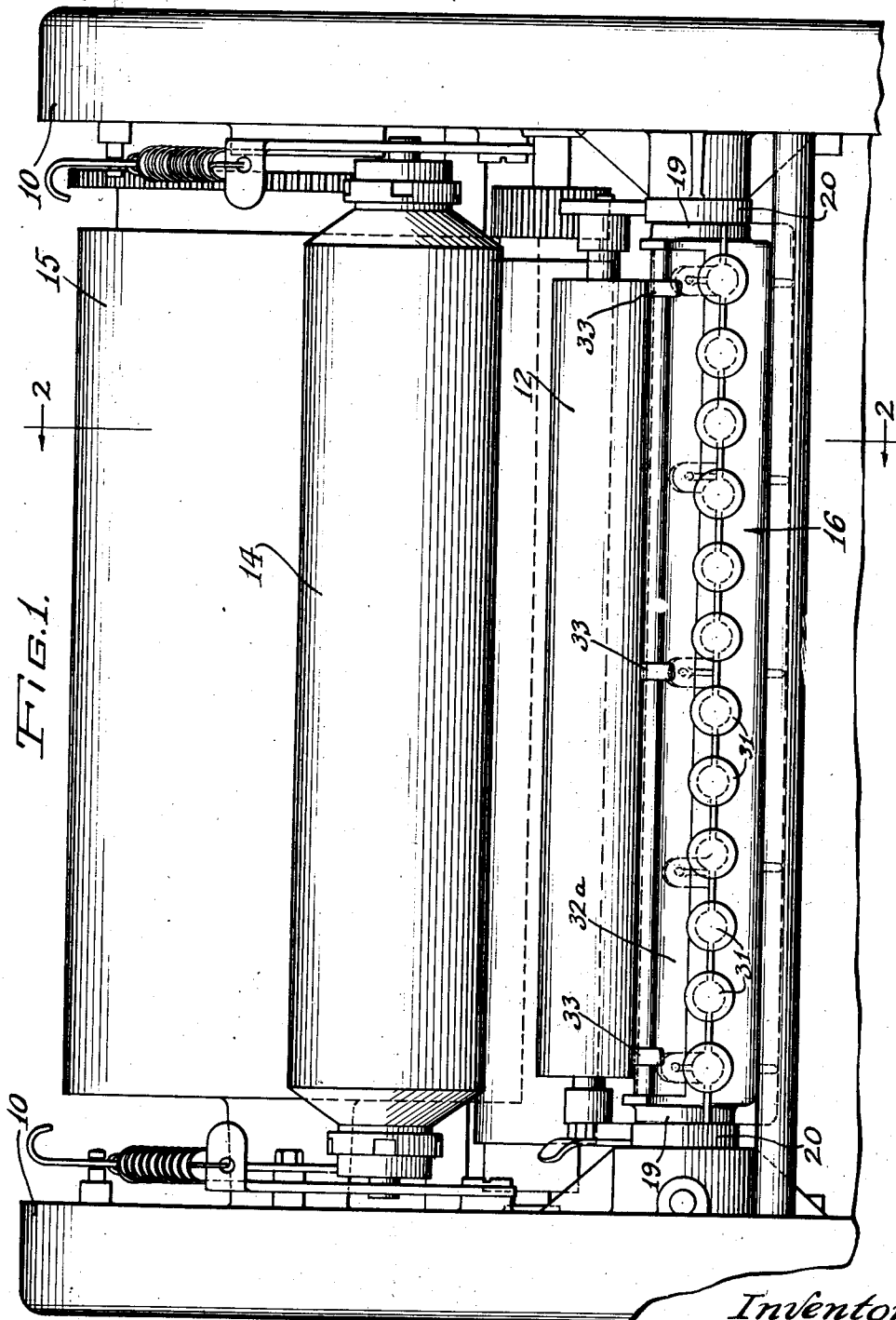
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2,382,103

INK FOUNTAIN AND LINER THEREFOR

Filed April 4, 1942

4 Sheets-Sheet 1



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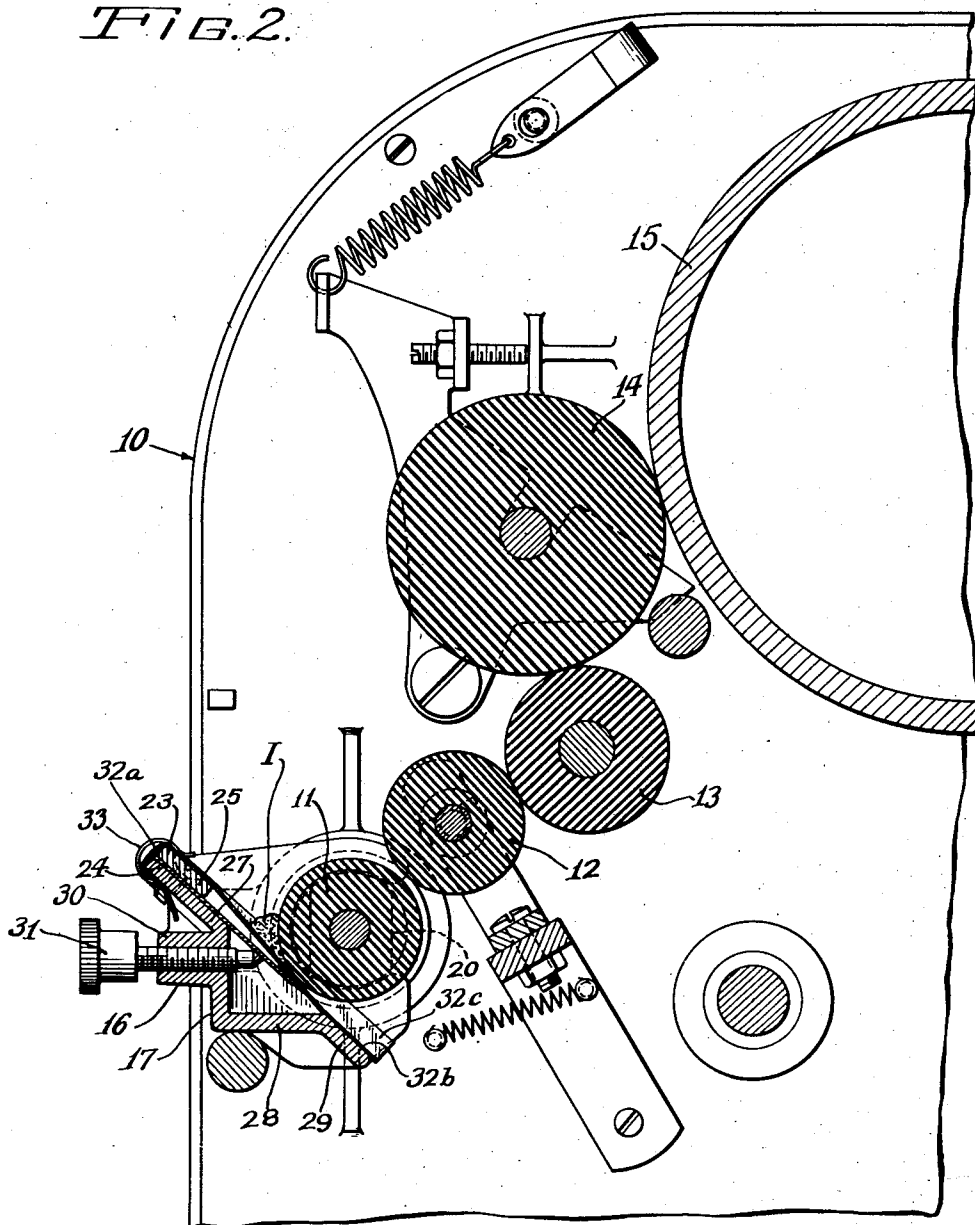
2,382,103

INK FOUNTAIN AND LINER THEREFOR

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4 Sheets-Sheet 2

FIG. 2.



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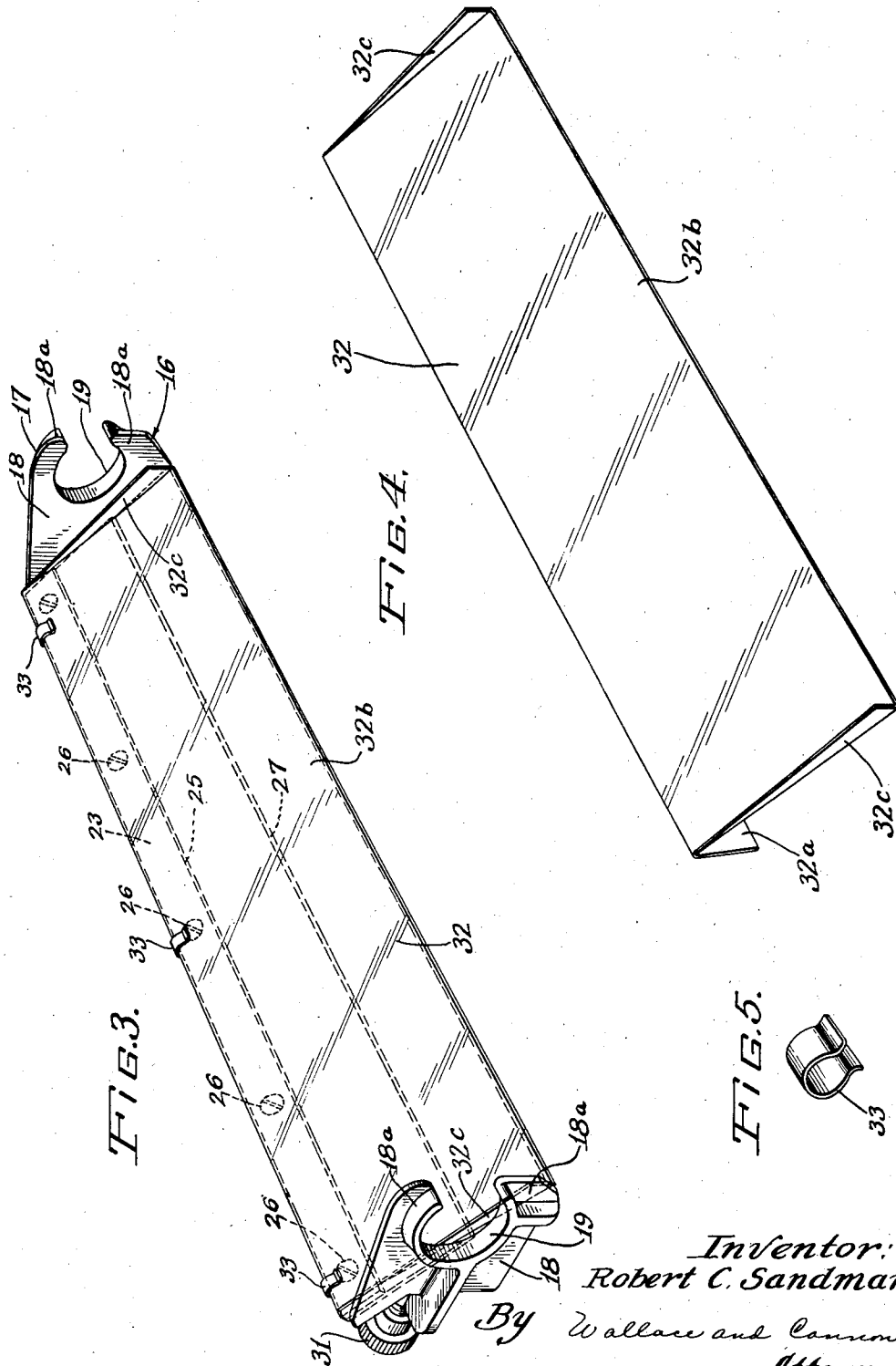
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INK FOUNTAIN AND LINER THEREFOR

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4 Sheets-Sheet 3



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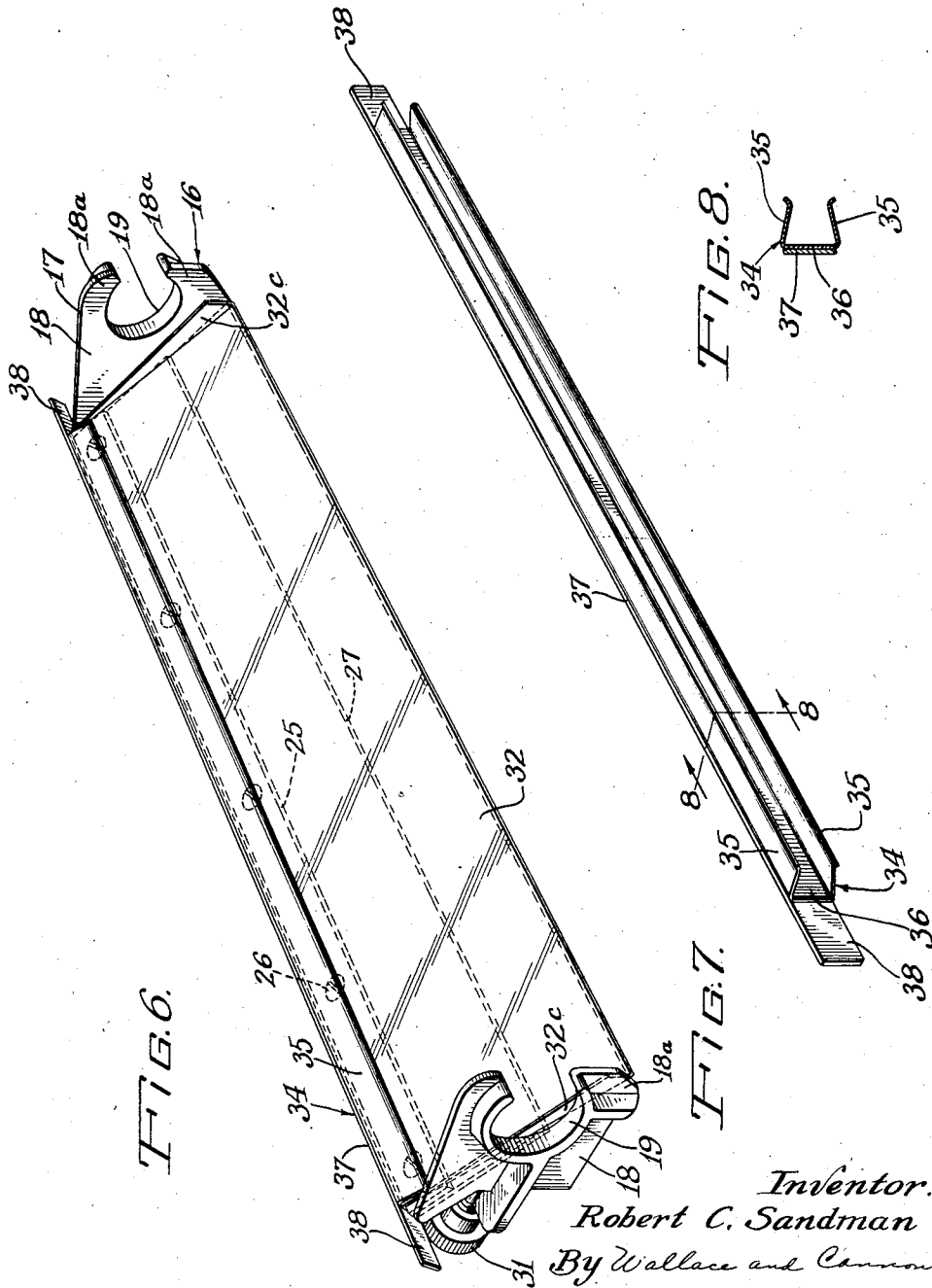
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INK FOUNTAIN AND LINER THEREFOR

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,382,103

INK FOUNTAIN AND LINER THEREFOR

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Application April 4, 1942, Serial No. 437,717

10 Claims. (Cl. 101—365)

This invention relates to ink fountains for printing and duplicating machines.

More specifically, this invention relates to a disposable and replaceable liner which is especially adapted for use in printing and duplicating machines of the character in which relatively very viscous ink is employed and which is applied from a stationary ink fountain to an inking roll from which it is transferred to the printing or duplicating mechanism in the machine.

The ink which is customary employed in such ink fountains is generally in the form of a paste which is applied to the fountain and transferred to an ink roll by wiping or frictional engagement of the latter with the ink. It is desirable or necessary, in the use of such duplicating apparatus, to clean the ink fountain from time to time and this involves some difficulty because, among other reasons, of the fact that the ink tends to stain the hands of the operator and this cleaning operation is, in general, an unpleasant task.

An object of the present invention is to enable an ink fountain of a duplicating or printing machine to be readily cleaned, as and when desired, without staining or soiling the hands of the operator.

The customary practice heretofore in the art has been to place the relatively very viscous ink or ink paste directly in or upon the body of the ink fountain itself and to remove the ink fountain from the duplicating or printing machine and clean it as and when necessary. It will be appreciated that this has required that the entire well or body of the fountain itself be cleaned with consequent soiling of the operator's hands.

Accordingly, another object of the invention is to afford a novel liner for use in an ink fountain of a duplicating or printing machine employing very viscous ink or ink paste which may be spread upon the liner itself, rather than upon the body of the ink fountain itself, as has been the customary practice heretofore, so that the ink fountain may readily be cleaned and the ink supply in the ink fountain replenished by merely removing the liner from the fountain and disposing of it and replacing the old liner thus disposed of with a new liner to which a fresh supply of ink may be applied.

Another object of the invention is to afford a novel disposable liner for the ink fountain of printing and duplicating machines of the character hereinbefore referred to and which is not only resistant to the wear or abrasion caused by the frictional or wiping engagement of the ink fountain roller with the relatively very viscous ink

or ink paste carried by the liner but which is also permanently resistant to the corrosive action of the ink itself.

An additional object of the invention is to afford a novel and simple but efficient retaining device for detachably holding the liner in position of use upon the ink fountain of a lithographic printing or duplicating machine or the like.

Other and further objects of the present invention will be apparent from the following description and claims and will be understood by reference to the accompanying drawings which, by way of illustration, show preferred embodiments and the principle thereof and what I now consider to be the best mode in which I have contemplated applying that principle. Other embodiments of the invention embodying the same or equivalent principle may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings,

Fig. 1 is a fragmentary front elevational view of a duplicating machine embodying an ink fountain of the character hereinbefore referred to and having a typical form of the new removable liner detachably mounted thereon;

Fig. 2 is a fragmentary vertical sectional view, on line 2—2 of Fig. 1, illustrating the new liner in position of use upon the ink fountain of a duplicating machine;

Fig. 3 is a perspective view of a typical form of ink fountain on which the new disposable liner may be employed, as embodied in the duplicating machine which is illustrated in Figs. 1 and 2, and showing the new disposable liner removably mounted thereon;

Fig. 4 is a perspective view of a preferred embodiment of the new disposable liner itself;

Fig. 5 is a perspective view of a typical and suitable means which may be employed for mounting the new disposable liner in position of use upon the ink fountain of a printing or duplicating machine;

Fig. 6 is a perspective view of an ink fountain similar to that shown in Fig. 4 but having mounted thereon a preferred form of retaining device for holding the disposable liner in position of use thereon;

Fig. 7 is a perspective view of the preferred form of liner-retaining device which is shown in position of use in Fig. 6; and

Fig. 8 is a transverse sectional view on line 8—8 in Fig. 7.

A typical lithographic duplicating apparatus

embodying an ink fountain of the character with which the present invention may be employed is fragmentarily illustrated in Figs. 1 and 2 of the drawings and comprises a supporting frame 10 in which an ink roll 11 is suitably journaled and by means of which ink may be transferred by way of an idler roll 12, intermittent rolls 13 and 14, to a printing cylinder 15 and thence to impression-receiving paper or the like, or, in the case of offset lithographic printing, by way of an offset rotary printing blanket roll.

It is to be understood, however, that the present invention is not concerned with the construction of the duplicating or printing machine with which the new disposable liner may be employed and hence a detailed description of the duplicating machine will not be given and only such parts will be described herein as are deemed necessary for an understanding of the present invention.

A typical form of an ink fountain with which the present invention may be employed, and as embodied in the duplicating machine which is illustrated in Figs. 1 and 2, is shown in Fig. 3, wherein the same is generally indicated at 16 and comprises a frame or body 17 having end walls 18 each of which is provided with a bearing surface 19. Each of the end walls 18 includes a pair of spaced arms 18a and the space between each pair of arms 18a provides an inlet or mouth to the adjacent bearing surface 19. Each of the bearing surfaces 19 is adapted for the reception of a squared end portion or bearing surface 20 of a stationary trunnion or bearing which is carried by the frame 10 of the duplicating or printing machine with which the ink fountain 16 is employed.

The frame 17 of the ink fountain 16 includes an upwardly extending flange 23 which is composed of a pair of plates 24 and 25 which are interconnected by screws 26 (Fig. 3) and held by and between these clamping plates 24 and 25 is a downwardly extending plate or doctor blade 27 which projects downwardly and tangentially relative to the peripheral surface of the ink fountain roller 11.

The ink fountain 16 also includes a horizontally extending bottom wall 28 having an angular and downwardly extending flange 29 and mounted in a horizontally extending flange 30 of the ink fountain is a row of horizontally extending adjusting screws 31 which are adapted to bear at their inner ends against the doctor blade 27 so as to adjust the latter, and the disposable liner arranged thereon, relative to the peripheral surface of the ink fountain roller 11.

A typical form of the new disposable liner is illustrated in Fig. 4 and comprises an oblong sheet of material 32, a preferred composition of which will be described hereinafter. In the practice of the invention the sheet 32 is preferably formed, in any suitable manner, into the shape, shown in Fig. 4, so as to afford a pair of substantially triangular-shaped and upstanding and transversely extending end walls or flanges 32c and a depending longitudinally extending flange 32a.

A preferred manner of mounting the new liner in position of use upon an ink fountain, as 16, comprises arranging the liner 32 upon the fountain 16, over the doctor blade 27, and bending the flange or portion 32a of the liner over and around the upper portion of the upwardly extending flange 23 of the ink fountain 16. The body of the liner 32 is then extended downwardly over the

upper surface of the doctor blade 27 and between the latter and the peripheral surface of the ink fountain roller 11, with the upwardly extending end walls or flanges 32c abutting the inner surfaces of the end walls 18 of the ink fountain 16, and with the lower end portion 32b of the liner bearing upon the surface of the downwardly extending lower flange 29 of the ink fountain 16, as best shown in Fig. 2.

The new disposable liner may be held in position of use upon the ink fountain 16 in various ways, within the scope and contemplation of this invention, and one means for accomplishing this result comprises a group of spring clips or clamps 33 which are adapted to be frictionally engaged upon the upwardly extending flange 23 of the ink fountain 16 so as to clamp the substantially U-shaped portion 32a of the liner 32 over and upon said upwardly extending flange 23 of the ink fountain 16.

In order to attach the new disposable liner 32 upon the ink fountain 16 the latter may be lifted off from the frame 10 of the machine and the liner 32 placed in position of use thereon, in the manner hereinbefore described. The removal of the ink fountain 16 from its position of use upon the machine is accomplished by turning the ink fountain clockwise, from the position in which it is shown in Fig. 2, until the spaces or mouths afforded by and between the arms 18a of the end walls 18 of the frame 17 of the ink fountain 16 are disposed in vertical alignment with the parallel side walls of the squared trunnion portions 20 on the frame 10 of the machine, whereupon the ink fountain 16 may be lifted off from the machine and the liner 32 installed thereon, in a manner hereinbefore described.

After the liner 32 has been mounted upon the ink fountain 16, a quantity of relatively heavy viscous ink or ink paste, which is indicated at I in Fig. 2, may then be applied to the upper surface of the liner 32, substantially midway between the upper and lower ends thereof, and extending from end to end of the liner as shown in Fig. 2. The ink fountain 16 with the thus applied disposable liner may then be installed in position of use upon the machine, this being accomplished by holding the ink fountain with the arms 18a of the end walls 18 thereof in such position that said end walls 18 may be slipped downwardly over the squared end trunnion portions 20. The ink fountain 16 may then be moved downwardly until it assumes the position in which it is shown in Figs. 1 and 2 of the drawings. When thus positioned the ink fountain and the disposable liners 32 carried thereby will be disposed substantially in the position in which they are shown in Fig. 2, and when so disposed the ink I (Fig. 2) which is disposed upon the upper surface of the liner 32 engages the peripheral surface of the rotary ink fountain roller 11 from which it may be transferred to other parts of the duplicating or printing machine with which the ink fountain 16 and the new disposable liner 32 thereon may be used, in a manner which need not be discussed herein.

When it is desired to clean the ink fountain 16 having the new disposable liner 32 attached thereto, it is merely necessary to remove the ink fountain 16 and attached liner 32 from position of use in the duplicating or like machine with which they are employed and to detach the liner 32 from position of use upon the ink fountain 16 by removing the spring clips or clamps 33. The thus removed liner 32 may then be dis-

posed of, leaving the ink fountain 16 itself substantially free from ink since in the practice of the invention the ink I is carried by the liner 32 and does not come into contact with the doctor blade 27 or with other parts of the ink fountain 16 itself. A new liner 32 may then be installed upon the ink fountain 16, in the manner hereinbefore described, and a quantity of ink applied thereto, whereupon the ink fountain with the thus installed liner may then be reapplied in position of use upon the duplicating or printing machine with which they may be employed.

It will be noted, in this connection, that the upstanding end walls or flanges 32c which are formed upon the new disposable liner 32 serve to keep the ink which is disposed upon the upper surface of the liner 32 out of contact with the end walls of the ink fountain 16.

It will be seen that inasmuch as the relatively very viscous ink or ink paste I which is carried by the disposable liner 32 is disposed in wiping or frictional engagement with the rotary ink fountain roller 11, when in use, considerable friction or drag is exerted upon the liner 32 by rotation of the ink fountain roller 11 so that the liner 32 must be resistant to such friction or drag and resulting abrasion as well as to the corrosive action of the ink and solvents to which it is exposed, as well as to the action of water and water-colored inks. Hence, it is not possible to use as and for the new liner any and all sheet materials, such as ordinary paper and the like, which might be cut or formed in the desired shape and applied to the ink fountain 16 in the manner in which the new liner 32 is applied thereto since most of such materials are either not sufficiently resistant to the corrosive action of the ink or ink solvents to which they would be exposed or, if so, will not withstand the abrasion resulting from the frictional drag of the ink fountain roller 11 on the ink I which is carried by the liner 32.

However, I have found that suitable sheet material for use in making the new disposable ink fountain liner 32 is the copolymer of vinyl chloride and vinyl acetate which is available upon the market under the trade name "Vinylite" (Carbide and Carbon Chemicals Corporation), and I have found that a sheet of this material approximately 0.003" thick, cut to desired length and width necessary to enable it to fit upon the ink fountain 16, is very suitable for use in the practice of the present invention. Such a material is disclosed in United States Patent No. 1,175,882 to Charles O. Young and Stuart D. Douglas which discloses a copolymer of vinyl chloride with vinyl acetate polymerized in the presence of lead tetraethyl, $Pb(C_2H_5)_4$, this material being flexible so that it may readily be installed in position of use upon an ink fountain and being permanently resistant to the corrosive action of the solvents employed in lithographic printing and duplicating inks and the like as well as resistant to the friction or drag and consequent abrasion caused by the rotation of the ink fountain roller 11 upon the viscous ink paste carried by the liner 32 when the latter is in use upon the ink fountain. Hence, this material is well suited for use in the practice of the present invention, although other suitable materials having the necessary characteristics or properties referred to above may likewise be employed within the scope and contemplation of the present invention, and the present invention, in its broader aspects, is not

limited to the use of the specific material hereinbefore referred to.

While the spring clips 33 afford suitable means for holding the new disposable liner 32 in position of use upon an ink fountain illustrated in the drawings, a preferred retaining device for holding the liner in position of use upon an ink fountain is shown in Figs. 6, 7 and 8 of the drawings and comprises a member 34 which is substantially U-shaped in cross section (Fig. 8) and is preferably formed of suitable resilient metal, such as spring steel, so as to afford a pair of spring clamping jaws which are interconnected by a bight portion 36, attached to the bight portion 36, in any suitable manner, as by soldering, welding or the like, is a backing member 37, which is preferably metallic, and this member 37 extends beyond the ends of the spring clamping jaws 35 so as to afford a pair of handle portions 38 or finger grips 38.

The backing member 37 affords rigidity and strength to the retaining device 34, as well as affording the finger grip or handle portions 38 at the ends of the retaining device, and while the backing member 37 is shown as being formed of a separate piece of metal attached to the bight portion 36, it is contemplated that within the scope of the invention the member 37 may be made integrally with the parts 35-36, that is to say, that the retaining device shown in Figs. 6, 7 and 8 may be made entirely of or in one piece, and in any suitable manner.

In the use of the retaining device which is shown in Figs. 6, 7 and 8, the latter may be readily applied in position of use, as shown in Fig. 6, so as to hold the liner 32 upon the ink fountain 16 by slipping the spring clamping jaws 35 upon the fountain after the manner in which the spring clamps 33 are inserted thereon. However, it will be noted, in this connection, that the rigid backing plate 37 and the handle portions 38 of the retaining device shown in Figs. 6, 7 and 8 facilitate inserting the retaining device 34 in position of use upon the ink fountain 16 and for this purpose the handle or finger grip portions 38 of the backing member 37 projects beyond the end walls 18 of the fountain 16 so that the retaining device 34 may be readily inserted into position of use upon, and removed from, the body of the ink fountain 16 by grasping the handle or finger grip portions 38 of the liner-retaining device 34.

I have found that when the new disposable liner is made from a sheet composed of a copolymer of vinyl chloride and vinyl acetate, as hereinbefore referred to, as well as when made from other materials, it is preferable that the grain of the sheet run parallel to the short axis of the liner and transversely relative to its long axis, since otherwise there is a tendency for the liner sheet to crack when it is being bent into position of use upon the ink fountain. Moreover, when thus arranged the frictional drag of the ink over the liner and the resulting wear on the liner sheet are materially reduced or minimized relative to the friction and wear to which the liner would be subjected if the grain of the liner sheet extended parallel to the long axis of the liner sheet and parallel to the long axis of the ink fountain roller, rather than transversely relative thereto, as is preferred, for the reasons stated.

While a sheet composed of a copolymer of vinyl chloride and vinyl acetate, as hereinbefore referred to, is especially adaptable for use in mak-

ing the new disposable liner where the latter is to be exposed to the action of lithographic inks, I have found that parchment is a very satisfactory material for making the new disposable liner for uses in which the liner will not come into contact with water, as when using water colors.

I have also found that when the new disposable liner is to be exposed to the action of water colors it may well be made of waxed paper which is resistant to such materials. However, the use of waxed paper for this purpose is limited to uses in which the liner will not be exposed to the action of any solvent for the wax. Moreover, I have found that where the new disposable liner is to be employed in conjunction with offset printing or duplicating machines employing lithographic inks which have a solvent action upon wax, the new liner is preferably made of a sheet composed of a copolymer of vinyl chloride and vinyl acetate hereinbefore described.

It will thus be seen, from the foregoing description, considered in conjunction with the accompanying drawings, that the foregoing invention affords a novel disposable liner for use upon an ink fountain of a duplicating or printing machine or the like and eliminates the necessity for, as well as the difficulties involved in cleaning such ink fountains, while being at the same time permanently resistant to the corrosive action of ink solvents to which it may be exposed in use as well as being resistant to abrasion caused by the friction or drag of the rotary ink fountain roller in contact with the relatively thick or resinous ink carried by the liner when in use.

It will thus be seen from the foregoing description, considered in conjunction with the accompanying drawings, that the present invention accomplishes its intended objects including those which have been specifically pointed out hereinbefore.

I claim:

1. As a new article of manufacture, a liner for an ink fountain consisting of a sheet of material formed to provide a bottom wall and upstanding portions at opposite ends of said bottom wall affording end walls, said material having a grain therein, the end walls at opposite ends of said bottom wall being disposed in substantially parallel relation to the grain of the material to thereby enhance the wear resistance of the liner.

2. As a new article of manufacture, a liner for an ink fountain consisting of a sheet of material composed of a copolymer of vinyl chloride and vinyl acetate, said sheet being formed to provide a bottom wall and upstanding portions at opposite ends of said bottom wall affording end walls, said material having a grain therein, the end walls at opposite ends of said bottom wall being disposed in substantially parallel relation to the grain of the material to thereby enhance the wear resistance of the liner.

3. As a new article of manufacture, a liner for an ink fountain consisting of a sheet of material composed of a copolymer of vinyl chloride and vinyl acetate polymerized in the presence of lead tetraethyl, said sheet being formed to provide a bottom wall and upstanding portions at opposite ends of said bottom wall affording end walls, said material having a grain therein, the end walls at opposite ends of said bottom wall being disposed

in substantially parallel relation to the grain of the material to thereby enhance the wear resistance of the liner.

4. As a new article of manufacture, a liner for an ink fountain consisting of a sheet of material composed essentially of a vinyl resin, said sheet being formed to provide a bottom wall and upstanding portions at opposite ends of said bottom wall affording end walls, said material having a grain therein, the end walls at opposite ends of said bottom wall being disposed in substantially parallel relation to the grain of the material to thereby enhance the wear resistance of the liner.

5. In a duplicating or printing machine or the like, the combination of, an ink fountain, an ink fountain roller adapted to convey ink from said ink fountain to printing or duplicating apparatus in the machine, a sheet adapted to be removably mounted upon said ink fountain in position to retain a quantity of highly viscous duplicating or printing ink or ink paste in said fountain in contact with said ink fountain roller but out of contact with the body of said ink fountain, and means for removably attaching said sheet upon said ink fountain, said ink fountain including means for adjusting said sheet and the ink carried thereby relative to the body of said ink fountain and relative to said ink fountain roller.

6. The combination as defined in claim 5 in which the grain of said sheet extends transversely relative to the long axis of said ink fountain roller.

7. The combination as defined in claim 5 in which the sheet is composed of a copolymer of vinyl chloride and vinyl acetate.

8. The combination as defined in claim 5 in which the sheet is composed essentially of a vinyl resin.

9. In a duplicating or printing machine or the like, the combination of, an ink fountain, an ink fountain roller adapted to convey ink from said ink fountain to printing or duplicating apparatus in the machine, a sheet adapted to be removably mounted upon said ink fountain in position to retain a quantity of highly viscous duplicating or printing ink or ink paste in said fountain in contact with said ink fountain roller but out of contact with the body of said ink fountain, and means for detachably clamping said sheet upon said ink fountain and comprising an elongated substantially U-shaped member embodying a pair of resilient clamping jaws and in which said member includes handle or finger clip portions, said portions extending beyond the ends of said resilient clamping jaws and beyond the end walls of said ink fountain.

10. In a duplicating or printing machine or the like, the combination, of an ink fountain, an ink fountain roller adapted to convey ink from said ink fountain to printing or duplicating apparatus in the machine, a sheet adapted to be removably mounted upon said ink fountain in position to retain a quantity of highly viscous duplicating or printing ink or ink paste in said fountain in contact with said ink fountain roller but out of contact with the body of said ink fountain, and a plurality of spring clips for detachably securing said sheet upon said ink fountain.

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