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P. T. TRUEMAN ET AL

2,172,115

MOISTENING DEVICE FOR DUPLICATORS

Filed April 19, 1937

2 Sheets-Sheet 1

Fig. 1.

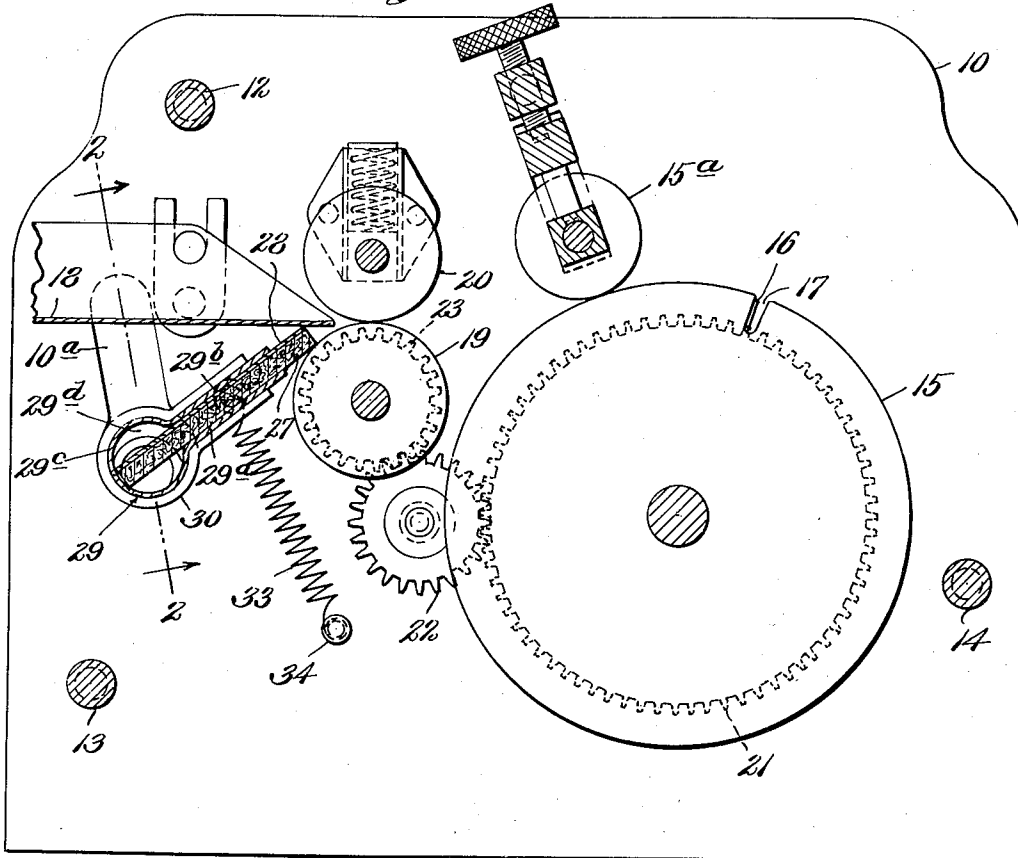


Fig. 5.

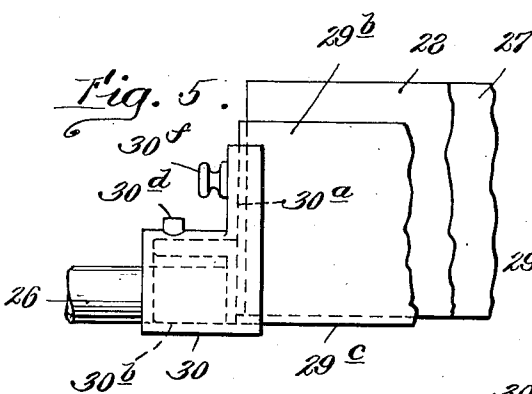
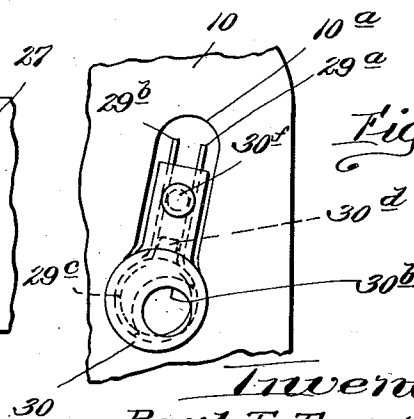


Fig. 6.



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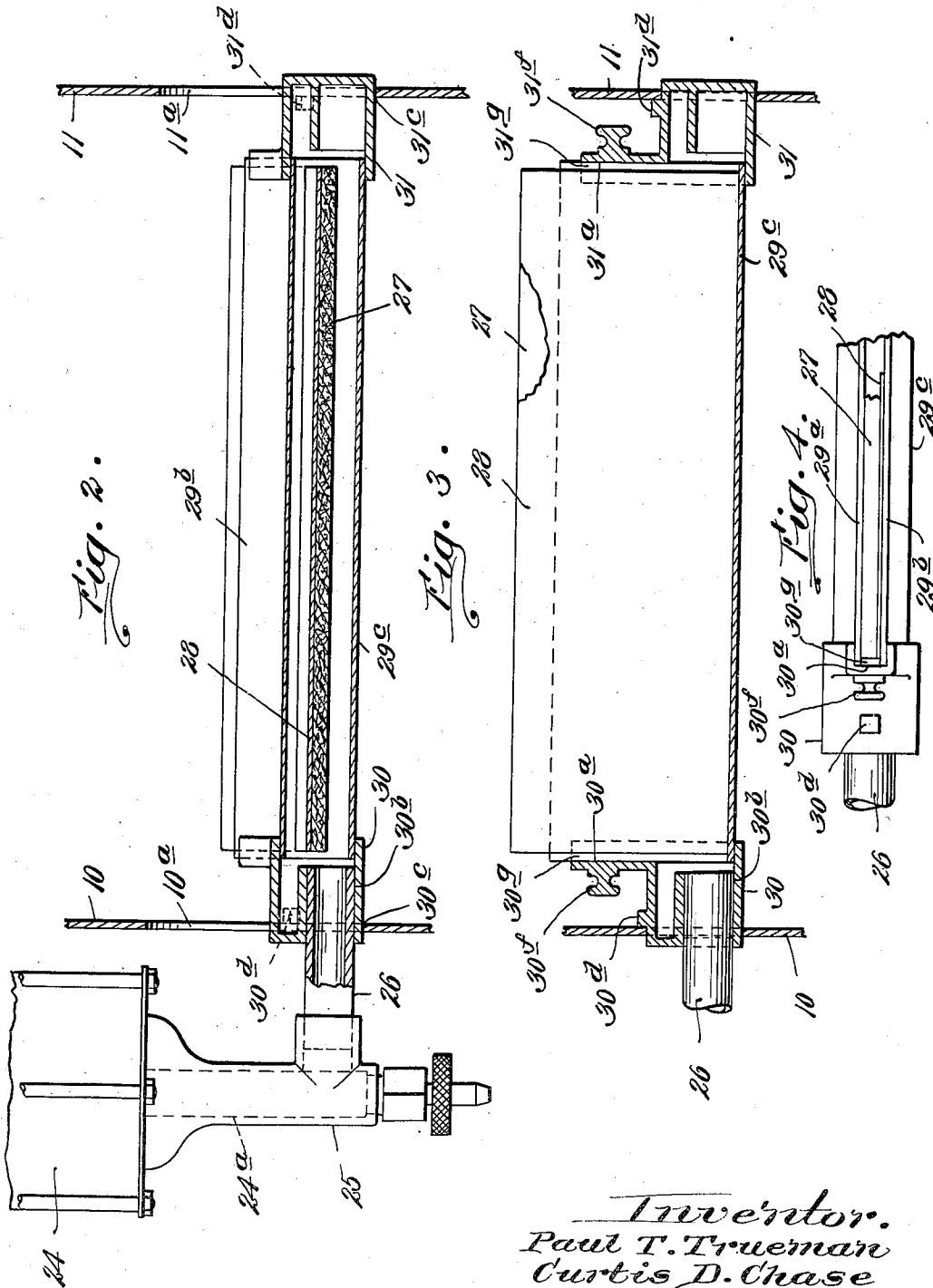
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MOISTENING DEVICE FOR DUPLICATORS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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MOISTENING DEVICE FOR DUPLICATORS

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2 Claims. (Cl. 91—48)

This invention relates to improvements in duplicating machines wherein the record copy or master sheet is made in reverse with suitable copying ink and reproduced therefrom on sheets of paper, or the like, having a moistened face and the invention relates more particularly to the novel construction of a fluid receptacle adapted to retain a predetermined level of fluid therein which is subsequently applied to a sheet by means of a capillary element.

In duplicating machines of the character described herein, it is the practice to moisten the clear sheet of paper, or the like, on which the duplicate copy is to be imprinted, by feeding the clear sheet into engagement with means for applying a film of volatile, quickly diffusing moistening fluid to the surface of the sheet and thereafter engaging the moistened sheet, under pressure, with the master copy.

To produce duplicate copies uniform in appearance, the quantity of moisture applied to the clear sheet must be uniform and evenly distributed over the face of the sheet, otherwise the copy will be heavy in some places and light in others. Further, a substantially like amount of moisture must be applied to each of the sheets to be duplicated upon to produce the desired results upon a large number of sheets; for example, 200 or more sheets.

A machine embodying the above general principles of duplicating from a master copy sheet of the referred to character is completely shown and described in the Storck Reissue Patent No. 19,951, issued April 28, 1936, and a modified form of a fluid tank for this type of machine is shown and described in the Storck Patent No. 2,036,972, issued April 7, 1936.

In a duplicating machine of the above type, the tank or fluid receptacle is preferably provided with a wick that extends into and engages with the fluid in the tank and, by the capillary action of the wick, withdraws the fluid from the tank to be subsequently deposited on the sheet. Preferably, the wick is disposed in a manner to permit its ready removal and replacement as it becomes necessary to change or renew the wick from time to time, due to the clogging of the wick from impurities in the liquid, or wear.

The primary object of our present invention is to provide an enclosed fluid receptacle of a simple and inexpensive construction that is adapted to maintain a predetermined level of fluid therein.

Another object of the invention is to so construct and arrange our fluid receptacle so that

the wick may be easily and conveniently inserted and positioned in the receptacle so as to engage with the fluid and, when so positioned, to extend beyond the tank to act in subsequently depositing fluid on the surface of a sheet.

A still further object of the invention is to provide a fluid receptacle unit that may be assembled and positioned in a duplicating machine in a simple and convenient manner so as to permit of a rockable movement of the unit and further, permit the unit to be readily removed from the machine.

The foregoing objects are intended as a general explanation of the invention and are not to be construed as a limitation, as further objects and advantages will be obvious from the novel combination and arrangement of parts hereinafter described and more specifically pointed out in the appended claims.

In the accompanying drawings we have shown our invention embodied with a duplicating machine sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings:

Fig. 1 is a transverse section of a part of a duplicating machine having our moistening device fluid receptacle embodied therewith.

Fig. 2 is a longitudinal section taken substantially along line 2—2, Fig. 1, and also shows the fluid supply reservoir.

Fig. 3 is a view corresponding substantially to Fig. 2, but shows the fluid receptacle in a different position.

Fig. 4 is a plan view of one end of the fluid receptacle.

Fig. 5 is a side elevation of one end of the receptable, and

Fig. 6 is a side elevation of a portion of one of the frames of the machine and shows the receptacle as it is positioned to be removed or positioned in the machine.

The duplicating machine

The duplicating machine as illustrated in the drawings is provided with opposed side frames 10, 11 between which the operating elements of the duplicator are mounted. The frames 10, 11 are retained in spaced relation by tie-rods 12, 13 and 14. The printing platen or drum 15 is mounted for rotation by any suitable means (not shown).

The printing platen 15 is provided with a clamping device 16 for holding one end of the reverse master copy sheet clamped in the groove 17.

The sheet to be duplicated upon is fed from the

tray 18 into contact with the feed rolls 19, 20 and advanced to the printing platen 15 and its coating pressure roller 15a. These feed rolls 19, 20 are rotatably mounted in the side frames and are adapted to engage with one another with a degree of pressure.

Secured to or rotated by the printing platen 15 is a gear 21 which meshes with an intermediate pinion 22 which, in turn, meshes with a pinion 23 associated with the roll 19 which, in this instance, is a combined feed and moisture applicator roll. As the printing platen 15 is rotated, the gearing connections cause the feed rolls 19, 20 to be rotated in unison therewith.

Parts similar to the above and their respective functions are clearly shown and described in the aforesaid patent, therefor, further detailed description of the machine is thought to be unnecessary.

The fluid supply reservoir

In this instance, we have utilized a reservoir 24 that is provided with a spout 24a through which the reservoir may be filled. When the reservoir 24 is in operative position, as illustrated at Fig. 2, the spout 24a closely engages in a corresponding bore in the angular member 25 that is provided with a conduit 26 which connects with the fluid feed receptacle in a manner that maintains the fluid at a determinate level in the receptacle and the supply in the reservoir air-locked to function in the now well known manner of a barometrically controlled fluid supply.

The fluid receptacle

The moisture feed for the intermediate applicator roll 19 in this instance embodies a substantially flat wick 27 that is provided with a backing plate 28 and is disposed lengthwise relative to the moistening roll 19 with the outer edge of the wick positioned in engagement with the peripheral face of the roll.

In our preferred form, as illustrated, the body portion 29 of the moisture applicator feed receptacle is formed of a sheet material of a suitable thickness to give the desired rigidity. This body portion in cross-section conforms substantially to a U-shape with the parallel walls 29a, 29b spaced apart in a manner to frictionally engage with the face of the wick 27 and its backing plate 28. In this instance, the lower part 29c of the body portion 29 is enlarged to form a chamber 29d in which the lower portion of the wick 27 engages.

To form our substantially enclosed fluid receptacle and to facilitate in assembling the receptacle, we prefer to provide end members 30, 31 having recessed faces 30a, 31a adapted to receive the opposed ends of the receptacle body 29. The end members 30, 31 may be secured to the receptacle body ends in any suitable manner to form tight joints between the body and the end members. One end member 30 is bored at 30b to receive one end of the conduit 26, and in this manner, the chamber 29d is connected with the fluid supply reservoir.

Each side frame 10, 11 is provided in this instance with a keyhole opening 10a, 11a and the lower portions of the openings are adapted to form bearings for the trunnions 30c, 31c of the end members 30, 31. Each trunnion is provided with a projection 30d, 31d that is adapted to engage with the inner face of the side frames, see Figs. 2 and 3, and thus lock the receptacle against longitudinal movement when the receptacle is operatively positioned between the side frames.

Positioning the moisture applicator feed receptacle

In positioning the feed receptacle in the machine, the reservoir 24, being a separate unit, is detached from its supporting member, and the wick 27, together with its backing plate 28, are removed in this instance from the receptacle, although it is obvious that the openings in the side frames could be such as would permit the inserting and positioning of the receptacle with the wick and backing plate in their assembled positions. The receptacle is then positioned as illustrated at Fig. 6 so as to be inserted into the machine and between the side frames with each of the trunnions 30c, 31c engaging with their proper bearings. When the receptacle is thus positioned, the wick 27 and its backing plate 28 may be conveniently inserted in their operative positions in the receptacle. The receptacle is then rotated in a clockwise direction until the outer edge of the wick 27 engages with the moistening roll 19. As the receptacle is rotated, the trunnion projections 30d, 31d engage with the inner faces of the opposed side frames 10, 11 as aforesaid.

So that the wick 27 will engage the moistening roll 19 with a degree of pressure, we have provided each of the end members 30, 31 with lugs 30f, 31f adapted to have one end of a pull spring 33 (only one of which is shown) secured thereto, the opposed ends of said springs 33 being fixedly secured in a suitable manner, as, for instance, to pivots 34 secured in the side frames.

It is to be particularly noted that, as illustrated, the length of the wick 27 is less than its opening formed in the receptacle so as to form air-vents 30g, 31g at the opposed ends of the wick and we have found that these air-vents should be not less than $\frac{1}{8}$ " in width so as to permit a satisfactory filling of the chamber 29d and a barometric action in maintaining a desired level of fluid in this chamber.

Operation

With the fluid feed receptacle and wick 27 operatively positioned, the reservoir 24 may be filled and operatively positioned as explained in the aforesaid Storck Patent No. 2,036,972. When the reservoir 24 is in operative position, fluid will flow therefrom, through the conduit 26, to the chamber 29d until the fluid reaches the height of the conduit opening and whereby the fluid supply becomes air-locked at this level. Fluid in the chamber 29d will saturate the wick 27 and, as the roll 19 is rotated, the outer end of the wick will apply a thin film of moisture to the peripheral face of the roll and, as a clear sheet to be operated upon is passed between the feed rolls 19, 20, the combined feed and moistening roll 19 will transfer moisture to the face of the clear sheet.

Having thus described our invention, what we claim is:

1. In a machine of the character specified having opposed side frames, a moistening device having opposed trunnions that form an integral part of the moistening device, openings in said frame adapted to rotatably support said trunnions with means for retaining said moistening device positioned between said frames, at least one of said openings being formed to permit removal of said device through said opening.

2. A device of the character specified having an intermediate moisture applicator with means for supplying a limited amount of moisture to

5 said applicator, said means embodying a body
portion of a continuous sheet of material formed
in a substantially U-shape and having spaced-
apart walls of substantially equal area and an
enlarged chamber portion of a substantially cylin-
drical contour, members adapted to receive the
opposed ends of said body portion in a manner
to form a substantially closed receptacle, said
walls forming a longitudinally extending opening,
10 a bibulous material disposed between said end

members and supported by said spaced-apart
walls, said bibulous material communicating with
said chamber and extending outwardly from said
longitudinal opening and communicating with
said intermediate moisture applicator, together
with means for supplying said chamber with a
determinate amount of fluid.

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