

June 8, 1937.

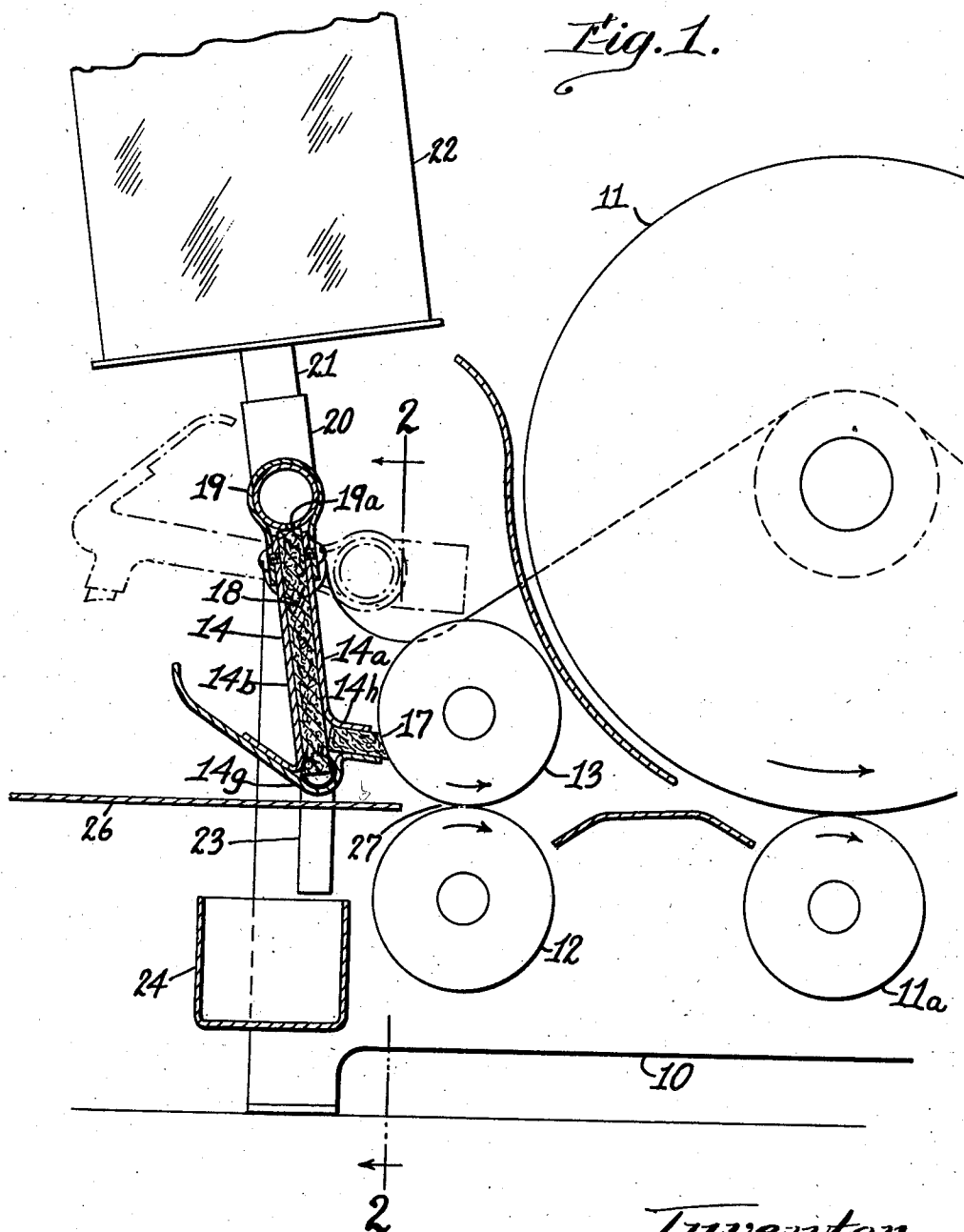
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2,083,042

SHEET MOISTENING DEVICE FOR DUPLICATORS

Filed Jan. 13, 1936

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

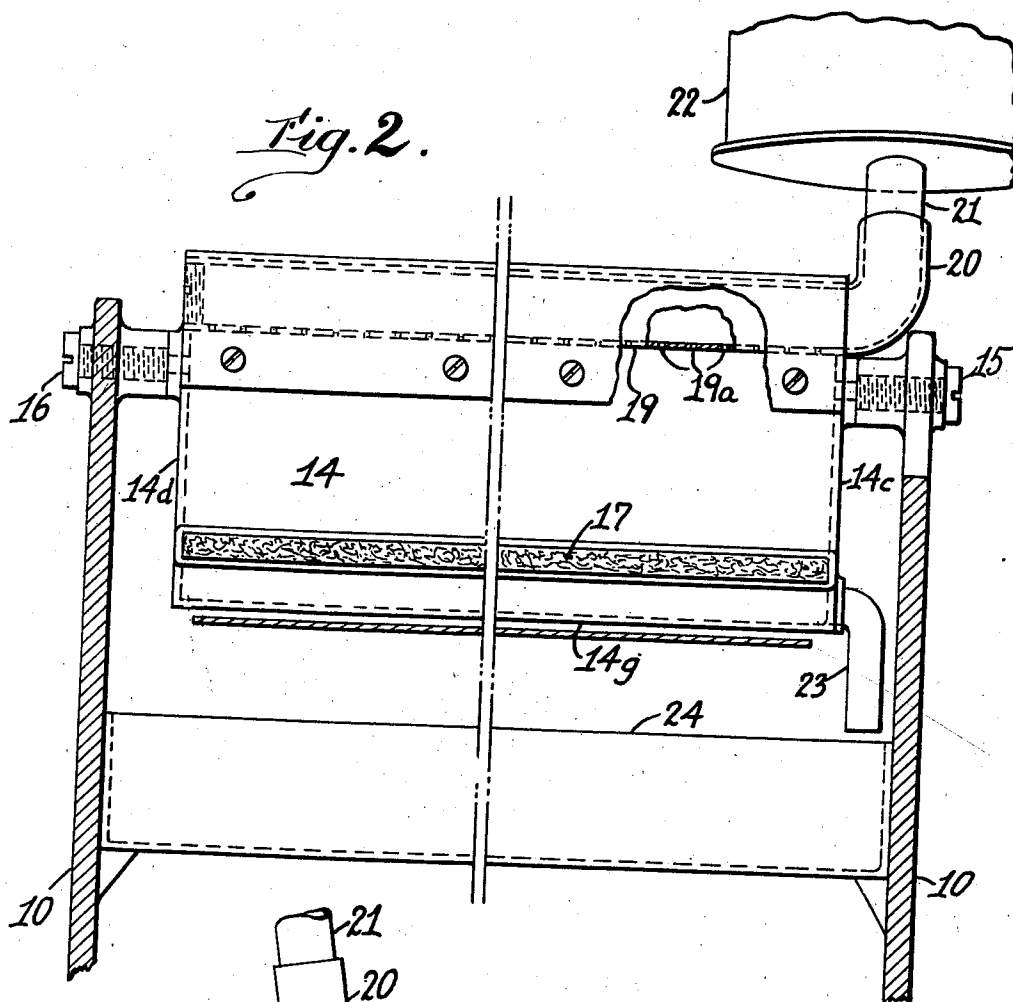
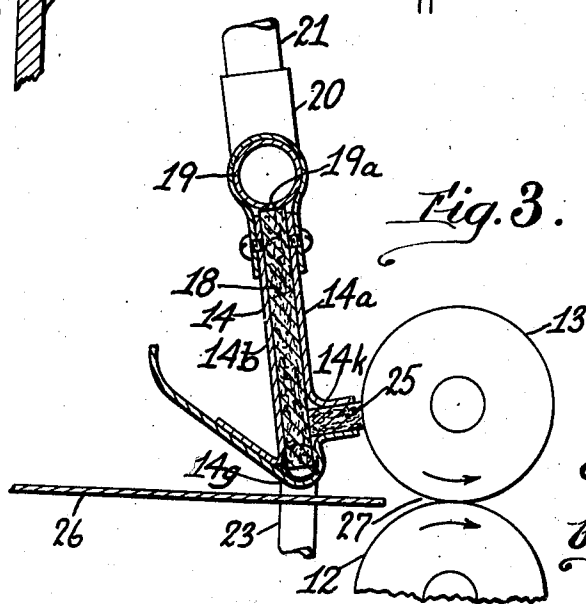


Fig. 3.



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SHEET MOISTENING DEVICE FOR
DUPLICATORS

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7 Claims. (Cl. 101—132)

This invention relates to duplicating machines in which a record is made on a sheet of paper or the like with ink characters formed in reverse with a suitable copying ink and reproduced therefrom as positive copies on duplicate sheets of paper or the like and my present invention relates more particularly to a moistening device adaptable to machines of the referred to character for moistening the face of the sheet to be duplicated upon prior to its engagement with the record copy.

In duplicating machines of the herein referred to character, which utilize the so-called "wet process" of duplicating, the clear sheet to be duplicated upon is moistened for the purpose of dissolving a minute amount of the copying ink imprinted in reverse on the master or record copy sheet and to be transferred to the clear sheet when engaged under pressure with the master copy.

To obtain desired and efficient results in duplicating with the referred to machines and process of duplicating, it is essential to utilize the medium of the moistened sheet to divide the copying ink of the master copy sheet into the number of duplicate copies desired. This desired number of duplicate copies may vary up to 200 or more.

While the character of the copying ink, fluid and paper to be duplicated upon has a direct bearing on the number of duplicate copies obtainable, this is to a minor degree only. The essential requirement is to obtain the maximum number of clear, sharp duplicate copies permissible from the particular character of the paper and ink to be used.

To obtain this desired maximum number of copies, the clear sheet to be duplicated upon must be moistened to an extremely limited extent, that is, the sheet must be uniformly and sufficiently moistened to, when engaged under pressure with the master copy, dissolve only sufficient of the master copying ink to reproduce a clear, sharp copy of the master on the clear sheet. If the clear sheet to be duplicated upon carries an excess of moisture, when it is engaged with the master copying ink, an excess of the ink will be dissolved therefrom and deposited on the clear sheet, thus resulting in fewer copies being obtainable from the master copy.

It is obvious from the above requirements that the control of the moisture to be applied to the clear sheet is of paramount importance.

In my U. S. Letters Patent No. 1,964,933 I have shown a device for controlling the fluid and,

while the essential features shown therein are not limited thereto, this device is particularly adapted, in this referred to patent, to moisten the under face of the clear sheet to be duplicated upon. One of the referred to essential characteristics for the control of the fluid, and as disclosed in my referred to patent, embodies an intermediate applicator to which fluid is supplied from a bibulous material. Fluid is supplied to and diffused by the bibulous material which, in turn, supplies moisture to the intermediate applicator and where the fluid is further diffused and limited for application to the face of a clear sheet as the clear sheet is engaged under pressure with the applicator.

In my present invention which, while not necessarily limited thereto, is particularly adapted for moistening the upper face of a clear sheet and in which I utilize the principles of my intermediate applicator with the bibulous material I have so arranged it that only a portion of the fluid supplied to the bibulous material will, in turn, be supplied or applied to the applicator.

The applying of moisture to the upper face of a clear sheet to be duplicated upon and in which, to a degree, the fluid must travel downwardly, presents a problem in the control of the fluid in view of the inherent action of gravity.

In duplicating machines of the referred to character heretofore known, the fluid has been fed downwardly from a receptacle to a bibulous material which is adapted for direct engagement of the clear sheet to be duplicated upon. The control of the fluid fed to the bibulous material has been effected by means of lifting or controlling valves or devices for regulating the dropping of the fluid into the bibulous material. With the use of the heretofore known devices expert attention is required to regulate the supply of fluid and which requirement may vary according to conditions.

Further, if inadvertently the operator omits to close the supply valve, the lower portion which is adapted for engagement with the clear sheet becomes over-saturated and the fluid will drip therefrom with attendant disadvantages and waste of the fluid, and upon further operation of the machine without rectifying this excessive accumulation of moisture, by replacement or otherwise, the sheets will be excessively moistened and thereby resulting in blurred duplicate copies being obtained from the master copy, and in many instances the master copy will be ruined by engagement with the first copy sheet so excessively moistened. Accordingly, the object of my present

invention is to provide a device for moistening the upper face of a clear sheet to be duplicated upon with a limited amount of a rapidly volatilizing fluid and to uniformly distribute the fluid moisture to the face of the sheet to be duplicated upon.

A further object is to provide a device that will require but a minimum of attention on the part of the operator in the control of the fluid supply.

Another object of my invention is to provide a moistening device for duplicators that is efficient and of a simplified construction and so arranged that excessive moisture will not accumulate to be deposited on the clear sheet to be duplicated upon.

With the above and other objects in view my invention comprises a novel combination and arrangement of parts hereinafter described and more specifically pointed out in the appended claims.

While not limited thereto, in the accompanying drawings I have illustrated a preferred form of my invention 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 wet process duplicator having my improved moistening device embodied therewith.

Fig. 2 is a sectional view taken substantially along line 2—2, Fig. 1, with some of the moistening device broken away to expose the interior construction, and

Fig. 3 is a sectional view of a modification of my moistening device.

As illustrated in the drawings, the duplicating machine is provided with opposed side frames 10 which support the elements of the machine. The printing platen or drum 11 is rotatably mounted in suitable bearings in the side frames 10 and is provided with a coating pressure roller 11a.

In this instance, I have shown opposed feed rollers 12, 13 which are adapted to engage one another under pressure. These rollers are adapted to be rotated, through suitable driving connections, not shown, in a direct relation to the rotation of the printing platen 11. A machine embodying the aforementioned elements with their driving connections and means for operation is completely shown and described, but with some of the elements in different positions, in my U. S. Letters Patent No. 1,964,933, therefore, further detailed description of the construction and operation of these duplicating machine elements is thought unnecessary.

The moistening receptacle 14 is pivotally supported within the side frames, in this instance by studs 15, 16. The receptacle comprises opposed side walls, 14a, 14b and opposed end walls 14c, 14d and an enclosed bottom 14g which is adapted to form a catch basin for a purpose hereinafter described.

The receptacle 14 is provided with a lateral portion 14h which is adapted to receive and support a readily removable strip or wick 17 of bibulous material. This wick 17 is adapted to extend inwardly to engage with the body of bibulous material 18 which is supported within the receptacle, and extends below the wick 17 and adjacent the catch basin portion 14g of the receptacle. The outer extending portion of said wick 17 is adapted for engagement with the peripheral face of the roller 13.

A conduit 19 is secured to the upper portion of

the receptacle and, in this instance, is provided with an elbow 20 adapted to receive and support the spout 21 of a refillable reservoir 22 from which fluid is supplied to the moistening device. A control valve, not shown, of any of the usual and well known structures, may be disposed between the reservoir 22 and the conduit for regulating the discharge of fluid from the reservoir. It is obvious that various devices may be utilized for supplying fluid to the receptacle 14 which contains the bibulous material such, for example, as stated supra. The conduit 19 illustrated is provided with a plurality of small openings 19a which are disposed in the lower portion of the conduit and communicate with the bibulous material 18.

As aforesaid, the fluid is supplied to the conduit 19, and, through the openings 19a, drops onto and saturates the bibulous material 18 in the receptacle 14. Over-saturation of this bibulous material 18 will cause an accumulation of the fluid to take place at the lower depending end of this bibulous material 18 and this excess fluid will drop therefrom into the receptacle catch basin 14g from which the fluid is discharged, through the conduit 23, into a suitable receptacle 24.

The bibulous material or wick 17 engages the bibulous material 18 and diffuses the limited moisture received therefrom by capillary action. This wick 17 being disposed above the lowermost horizontal plane of the depending portion of the bibulous material 18, it is not subjected to an excess accumulation as is this referred to depending portion.

In this particular instance, the reservoir 22 is so angularly disposed relative to the pivotal point of the receptacle as to cause pressure to be exerted by the wick 17 as it engages the peripheral face of the roller 13 although, it is obvious that this pressure may be effected in various ways as, for example, by means of a tension spring or like device.

At Fig. 1 I have illustrated my wick 17 disposed at a downwardly sloping angle relative to the bibulous material 18 but the lowermost point of the wick 17 is disposed above the lower terminating plane of the bibulous material 18.

At Fig. 3 I have shown a modification of my moistening device and wherein the lateral portion 14h of the receptacle 14 is disposed at a slightly elevated angle relative to the receptacle 14 and thus the wick 25 would effect substantially an up-wicking of the fluid from the bibulous material 18.

The wicks 17 or 25 may be disposed in either angular relationship and in varying degrees, but in either event, to effect an efficient control of the fluid application, the lowermost plane of the wick should be disposed above the lowermost terminating point of the bibulous material from which the wick receives its supply of moisture.

As the rollers 12, 13 are rotated, the wick 17 will apply a thin film of fluid to the roller 13. This thin film is further diffused by the surface attraction of the roller and it, when engaged with a sheet to be duplicated upon, uniformly applies this limited diffused moisture to the face of the sheet.

In the operation of my moistening device the sheets to be duplicated upon are placed upon a suitable support having a guide plate 26 which is disposed in substantial alignment with the bight 27 formed by the rollers 12, 13. This guide plate 26 is disposed in a spaced relation below the

moistening device and is adapted to position the advanced forward end of the sheet in and against the bight 27 while the rollers 12, 13 are at rest.

When the rollers 12, 13 are actuated, the sheet is advanced by and between the rollers and moisture applied to the applicator roller is transferred to the upper face of the advancing sheet and thereby this sheet is provided with a limited uniformly distributed moisture.

As the moistened sheet is advanced, by the rollers 12, 13, it is directed for engagement by and between the pressure roller 11a and the printing platen 11 which then act as the feeding elements to advance and engage the moistened sheet under pressure with the master copy as set forth in my hereinbefore referred to patent.

The present embodiment of my moistening device is to be construed as illustrative, as obviously modifications may be made therein by those skilled in the art without departing from the spirit and scope of my invention.

Having thus described my invention, what I claim is:

1. In a machine of the character described for duplicating from a master copy sheet; a moistening device embodying an applicator adapted to engage with said sheet under pressure, a bibulous material in engagement with said applicator, a second body of bibulous material angularly disposed relative to said first bibulous material and in engagement therewith, said second bibulous material having a portion depending below the lowest point of said first material with means to supply said second bibulous material with moisture.

2. In a machine of the character described for duplicating from a master copy sheet; a moistening device embodying an applicator adapted to engage with said sheet under pressure, a fluid receiving and draining device, a bibulous material in engagement with said applicator, a second body of bibulous material in engagement with said first body of material and having a portion depending below the lowest point of said first body and disposed relative to said fluid receiving and draining device and means to supply said second body of bibulous material with moisture.

3. In a duplicating machine of the character specified; a moistening device embodying opposed rotative rollers which are adapted to engage said sheet to be moistened under pressure, with means for rotating said rollers, a body of bibulous material in engagement with the portion of the peripheral face of one of said rollers, a second body of bibulous material angularly disposed relative to said first bibulous material and in engagement therewith, said last bibulous material having a portion depending

below the lowest point of said first material, with means to supply said second bibulous material with moisture.

4. A duplicating machine of the character specified having in combination therewith a moistening device which includes a bibulous material in longitudinal engagement with a portion of the peripheral face of the uppermost of said rollers, bibulous material angularly disposed relative to said first bibulous material and in engagement therewith, said last bibulous material having a portion thereof depending below the lowest point of said first material, with means to supply said second bibulous material with moisture.

5. In a machine of the character specified for duplicating onto clear sheets and the like from a master copy sheet, a device for moistening the upper face of a sheet to be duplicated upon, said device embodying opposed rotative rollers disposed one above the other and which are adapted to engage with one another under pressure, with means for rotating said rollers, a body of bibulous material disposed in front of the uppermost of said rollers and spaced therefrom, a lateral body of fibrous material in engagement with said first body of material and said uppermost roller, said first body of material having a portion depending below the horizontal plane of said lateral material, with means to supply moisture to the uppermost area of said material.

6. In a machine of the character specified for duplicating onto clear sheets and the like from a master copy sheet; a device for moistening the upper face of said sheet to be duplicated upon, said device embodying opposed rotative feed rollers disposed one above the other and which are adapted to engage with one another under pressure, a receptacle pivotally disposed in front of said rollers and having a discharge conduit associated with the lowermost portion thereof, a lateral receptacle integral with said first receptacle and communicating therewith, said lateral receptacle being disposed above said discharge conduit, a bibulous material disposed within said first receptacle, a readily removable bibulous material disposed within said second receptacle, said last material being adapted for engagement with said first material and to engage under pressure with the peripheral face of said uppermost roller, with means to supply moisture to said first bibulous material.

7. In a machine for duplicating as set forth in claim 5 wherein said first moistening device receptacle is pivoted for movement toward and away from said rollers and whereby said second bibulous material may be readily removed and replaced.

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