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W. RITZERFELD ET AL
DUPLICATOR MOISTENING DEVICE

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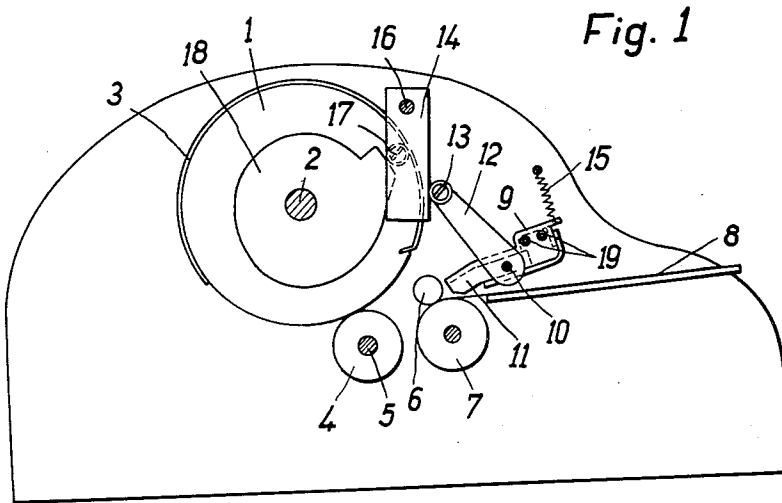


Fig. 2

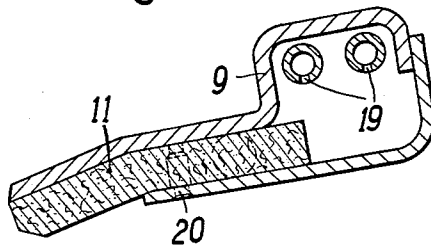
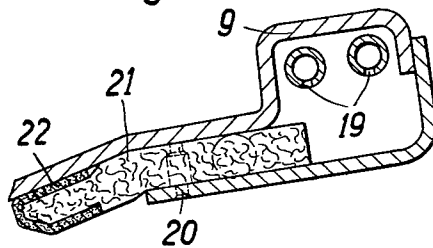


Fig. 3



Inventors
Wilhelm Ritzfeld
Gerhard Ritzfeld
BY Michael S. Sticker
Attorney

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DUPLICATOR MOISTENING DEVICE

Wilhelm Ritzerfeld, Schorlemer Allee 14, Berlin-Dahlem, Germany, and Gerhard Ritzerfeld, Franzensbader Str. 21, Berlin-Grünwald, Germany

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4 Claims. (Cl. 118-264)

The present invention relates to duplicators, and more particularly to the moistening devices used in duplicators in which the copy sheet is moistened prior to being brought in contact with the master sheet.

In many devices of this kind, moisture is applied to the copy sheet by means of felt body to which liquid is supplied and which is contacted by the copy sheet. The requirements made on such a felt, liquid-transfer body are that the same must possess a sufficient capacity to absorb liquid, and sufficiently high mechanical resistance against the abrading effect of the copy sheets passing in contact with the surface of the moistened felt body. Conventionally used Merino felts possess acceptable absorptive capacity, however, the mechanical properties, i.e. the abrasion resistance of Merino felt is rather low so that the edge portion of such Merino felt body which is to come in contact with the copy sheets, can be used only for about 3000 to 5000 copies. Depending on the degree of abrasion, the moisture transferring Merino felt portion will change in position relative to the passing copy sheets, will contact the counter roller, cause an increase in the width of the unmoistened rim portions of the copy sheets, and will interfere with the proper registry of the copy sheets. Attempts have been made to overcome the above discussed difficulties by using felts made of materials which would not be subject to such a high degree of wear and tear. However, such other materials tried up to now did not possess the desired high absorption capacity for the moistening liquids. Furthermore, conventionally employed felt materials are frequently subject to swelling upon absorbing water, alcohol or other moistening liquids, and consequently are subject to shrinking upon drying. This change in the dimensions of the felts depending on the degree of wetness or dryness of the same also cause considerable difficulties.

It is therefore an object of the present invention to overcome the afore-mentioned difficulties experienced in connection with conventional duplicator moistening devices.

It is another object of the present invention to provide a duplicator moistening device having a felt body as the liquid-transferring element and being capable of moistening a very great number of copy sheets without appreciable wear and tear.

It is a further object of the present invention to provide a moistening device for a liquid duplicator including a liquid-transferring felt body which will not appreciably change its dimensions upon repeated drying and moistening of the same, and which possesses high resistance against abrasion combined with a great absorptive capacity so that adjustments and replacements of the felt member will be reduced to a minimum and a perfect registry between copy sheet and master sheet will be maintained even when imprinting many thousands of copy sheets.

Other objects and advantages of the present invention will become apparent from a further reading of the description and of the appended claims.

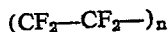
With the above and other objects in view, the present invention comprises in a duplicator, in combination, a moistening device comprising liquid-transferring means for applying a liquid to a copy sheet so as to moisten the same, the liquid-transferring means including a felt body

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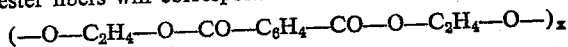
having at least a surface portion consisting of a fibrous material selected from the group consisting of polytetrafluorethylene fibers and polyester fibers, and means for supplying liquid to the liquid-transferring means.

Thus, according to the present invention, the liquid-transferring means of the moistening device will consist essentially of a felt or fleece made of polytetrafluorethylene or polyester fibers, such as polyester fibers produced of ethylene glycol and terephthalic acid. Of course, polyester fibers made of different constituents can also be used.

Broadly, the chemical composition of the polytetrafluorethylene fibers can be described as:



wherein "n" equals between 50,000 and 200,000, and preferably about 120,000. The composition of the polyester fibers will correspond to:



wherein "x" equals between 5,000 and 11,000, preferably about 8,500.

As moistening liquids, in connection with the liquid-transferring means according to the present invention, may be used, for instance, water, alcohol (such as methyl or ethyl alcohol) or water-alcohol mixtures, as well as diluted organic acids, for instance tartaric acid or lactic acid, or alkaline solutions, such as solutions of sodium carbonate, borax, or di-ethanolamine.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

FIG. 1 is a schematic side view illustrating a duplicating machine including a moistening device according to the present invention;

FIG. 2 is an elevational view in cross section of an embodiment of the moistening device of FIG. 1; and

FIG. 3 is an elevational view in cross section of another embodiment of the moistening device of the present invention.

Referring now to the drawings, and particularly to FIG. 1, the rotating duplicator shown therein includes a duplicating roller 1 rotatable about shaft 2. The master sheet 3 which is to be copied is attached to duplicating roller 1 in conventional manner. A counterpressure roller 4, rotatable about shaft 8, cooperates with duplicating roller 1. Two feeding rollers 6 and 7 are arranged in such a manner that the copy sheet 8 can be placed in contact with rollers 6 and 7 and moistening device 9 can be placed so as to cooperate with lower counterpressure roller 7. Furthermore, moistening device 9 is pivotable about pivot 10. Moistening device 9 includes a felt body 11 consisting, as described further above, of polytetrafluorethylene fibers or polyester fibers. Lever 12 is rigidly attached to moistening device 9 and is pressed with its pivotal shaft 13 against lever 14 by the action of spring 15. Lever 14 is turnable about shaft 16 and rests with roller 17 on curved portion 18 which is attached to duplicating roller 1. Curved member 18 will upon rotation of duplicating roller 1, cause moistening device 9 to contact copy sheet 8 as soon as feeding rollers 6 and 7 draw copy sheet 8 into the duplicator. Liquid is supplied to felt body 11 through conduit 19 in such a manner that the polyester or polytetrafluorethylene felt will be maintained in moist condition and capable of giving up liquid to copy sheets 8 when the same pass in contact with felt 11.

As shown in FIG. 2, felt body 11 is maintained in position by a clamping action of the two walls of the moistening device 9 shown in cross section above and below portions of felt 11, and by bolt or bolts 20.

According to a preferred embodiment of the present invention, felt body 11 is replaced by a composite felt body having a main portion 21 consisting of, for instance, Merino felt, i.e. of a felt material of high absorption capacity but low abrasion resistance, and of a polyester or polytetrafluoroethylene felt portion 22 which covers part of the surface of the Merino felt body, particularly in the area where copy sheet 8 will come in contact with the felt body.

Surprisingly, it has been found that moistening devices including felt bodies consisting wholly or at least in their surface portion which will come in contact with copy sheets, of a polytetrafluoroethylene or polyester felt, will possess the desired high absorption capacity, i.e. the ability to retain and to give up liquid, together with a high degree of abrasion resistance which cannot be found in any of the other materials which might possess a desirable absorption capacity.

Particularly good results have been achieved when, according to the preferred embodiment of the present invention illustrated in FIG. 3 of the drawing, the polytetrafluoroethylene fiber or polyester fiber fleece or felt is attached (by sewing or in other convenient and conventional manners) in the form of a relatively thin sheet to the surface edge portion of a Merino felt body, or to cover the entire Merino felt body with a sheet of polytetrafluoroethylene or polyester fiber felt.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of duplicating machines differing from the types described above.

While the invention has been illustrated and described as embodied in a moistening device for a rotating duplicating machine, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the

standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a duplicator, in combination, a moistening device comprising liquid-transferring means for applying a liquid to a copy sheet so as to moisten the same, said liquid-transferring means including a felt body having at least a surface portion consisting of a fibrous material selected from the group consisting of polytetrafluoroethylene fibers and polyester fibers; and means for supplying liquid to said liquid-transferring means.

2. In a duplicator, in combination, a moistening device comprising liquid-transferring means for applying a liquid to a copy sheet so as to moisten the same, said liquid-transferring means including a felt body consisting of a fibrous material selected from the group consisting of polytetrafluoroethylene fibers and polyester fibers; and means for supplying liquid to said liquid-transferring means.

3. In a duplicator, in combination, a moistening device comprising liquid-transferring means for applying a liquid to a copy sheet so as to moisten the same, said liquid-transferring means including a felt body having at least a surface portion consisting of polytetrafluoroethylene fibers; and means for supplying liquid to said liquid-transferring means.

4. In a duplicator, in combination, a moistening device comprising liquid-transferring means for applying a liquid to a copy sheet so as to moisten the same, said liquid-transferring means including a felt body having at least a surface portion consisting of polyester fibers; and means for supplying liquid to said liquid-transferring means.

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