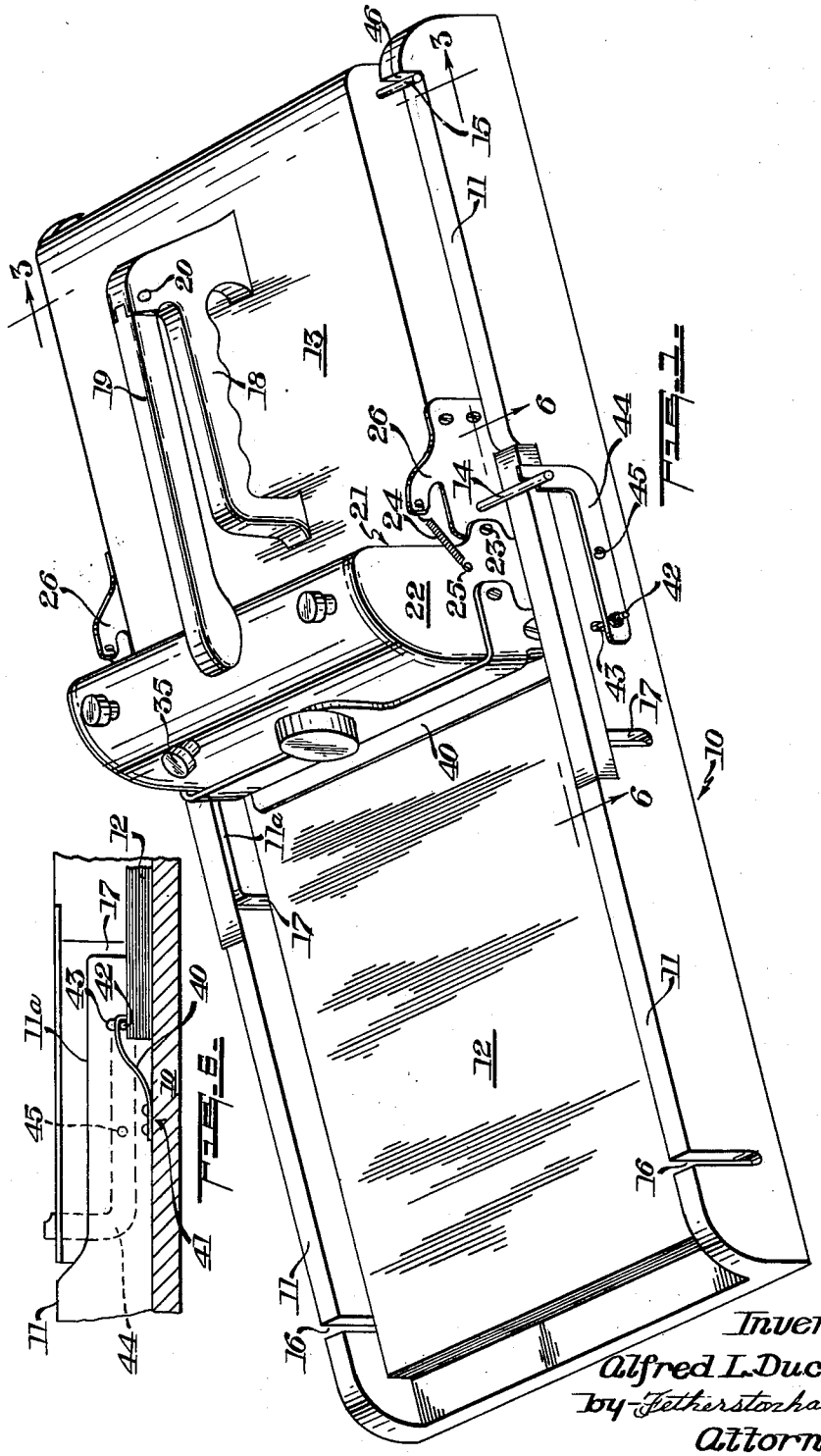
June 15, 1954 A. L. DUCKETT 2,681,005

DUPLICATING MACHINE

Filed June 2, 1952 2 Sheets-Sheet 1



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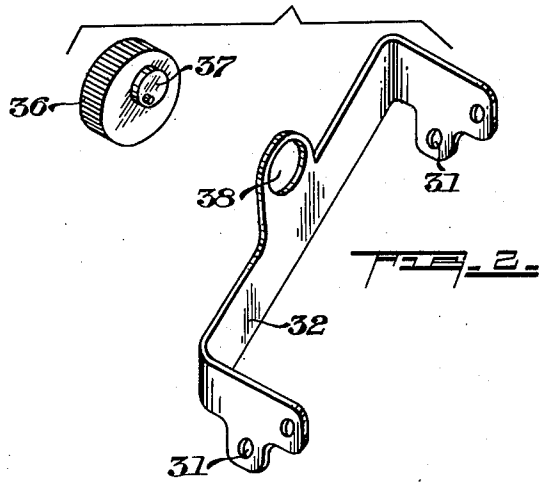


FIG. 2.

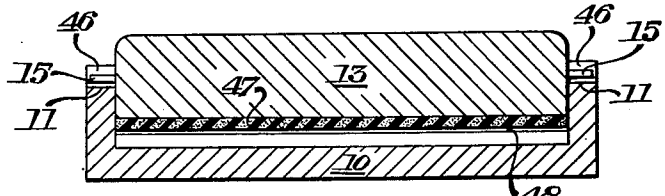


FIG. 3.

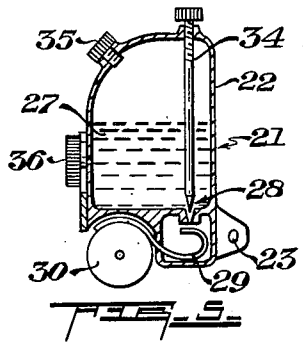


FIG. 5.

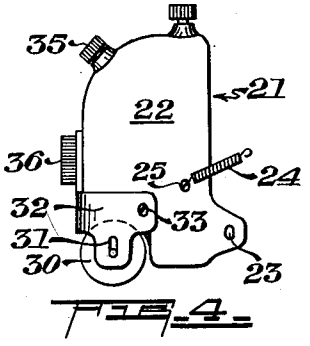


FIG. 4.

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## DUPLICATING MACHINE

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Application June 2, 1952, Serial No. 291,155

7 Claims. (Cl. 101—134.5)

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This invention relates to a duplicating machine of the type wherein an ink-carrying printing medium is brought to bear against a sheet of copy paper leaving a reproduction thereon.

The principal object of my invention is to provide means for duplicating through the use of copying ink or the like carried by or stencilled in a master sheet by simple operations and simple mechanism. Specifically, I accomplish this object through the use of a bed having a raised track on either side thereof. The sheets to be printed are held in the bed between the tracks by means to be hereinafter more fully described. A body or block having the ink-carrying printing medium affixed to its underside is adapted to ride on the tracks. The riding means associated with the block are arranged to fall into slots formed in the track so that the block with its ink-carrying printing medium comes down upon the uppermost of the copying sheets and leaves an impression thereon.

It is preferred to use a printing medium of the type which requires that the ink be moistened before an impression can be obtained. In this event, I provide a moistening roller pivotally attached to the front of the block and arranged to be pushed downwardly against the top sheet of copying paper. Thus, by moistening the top sheet, an impression will be left thereon when the ink-carrying printing medium comes in contact therewith.

The invention will be more fully understood by reference to the attached drawings taken in conjunction with the following detailed description.

In the drawings:

Figure 1 is a perspective view of the assembled duplicating machine;

Figure 2 is a perspective view showing the member in which the moistening roller is journalled;

Figure 3 is a sectional view taken along the line 3—3 of Figure 1 and looking in the direction of the arrows;

Figure 4 is a side view of the moistening assembly;

Figure 5 is a view similar to Figure 4 taken in cross-section, and

Figure 6 is a vertical sectional view of part of the bed taken along the line 6—6 of Figure 1 looking in the direction of the arrows.

Referring now to the drawings in detail, 10 represents the bed on either side of which are formed raised tracks 11. In the center of the bed 10 between the tracks 11 is a stack 12 of copying sheets. The stack 12 is held in place by means to be hereinafter described.

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A block 13 is disposed between said tracks and has forward riding means 14 and rearward riding means 15 on each side thereof. The means 14 and 15 which are adapted to ride on the tracks 11 are shown as pins but may be anti-friction rollers or the like, if desired. At the forward end of each track 11 is a slot 16 which is adapted to receive each of the forward riding means 14 when the block is pushed forward along the tracks 11. The tracks 11 have slightly lowered portions 11*a* (see Figure 6) leading to a second pair of slots 17 which are adapted to receive the rearward riding means 15 when the block is pushed forward along the tracks 11. It will be understood that the slots 17 are spaced from the slots 16 a distance equal to the distance apart of the riding means 14 and 15.

The block 13 is provided with a handle 18 on which a pressure bar 19 is hingedly attached at 20. At the forward end of the block 13 is a moistening device 21 which is shown in full and sectional elevation in Figures 4 and 5. The moistening device 21 comprises a hollow body or reservoir 22 which is hingedly attached to the block 13 at 23. One end of a spring means 24 is attached to the moistening device 21 at 25, and the other end to a bracket 26 mounted on the block 13 so as to give the moistening device 21 a clockwise bias. It will be understood that this biasing arrangement is provided at each end of the moistening device 21.

Disposed within the hollow body 22 is the moistening agent 27. The moistening agent 27 is fed by gravity through an adjustable valve 28 to a wick 29. A moistening roller 30 is journalled in a vertical slot 31 in a member 32 which is hingedly attached to the hollow body 22 at 33. The opening of the valve 28 may be adjusted by manipulation of the valve stem 34 which is threaded in the top of the hollow body 22. A cap 35 is provided in the hollow body 22 to enable replenishing of the moistening agent when necessary.

When no pressure is applied to the pressure bar 19 the moistening device 21, in general, and the moistening roller 30, in particular is held clear of the copying paper 12 by the spring means 24. The amount of this clearance may be adjusted by manipulation of the cylindrical member 36 which is journalled in the hollow body 22. The cylindrical member 36 has formed thereon a portion 37 which is slightly off-center and this portion 37 rides in an elliptical hole 38 formed in the member 32. By rotating the cylindrical member 36, the portion 37 riding in the hole 38 gives an eccentric action which causes the mem-

ber 32 to rotate about its pivots 33. In this way, the clearance of the moistening roller 30 from the stack 12 of copying paper may be readily adjusted.

The stack 12 of copying paper is held in position at its rearward end by a spring clip 40 which is shown in Figure 6 and partly in Figure 1. The spring clip 40 is fastened to the bed at 41 and is made of spring steel or like material. A rod 42 extends under the unfixed edge of the spring clip 40 and through a slot 43 in each track 11. Each extremity of the rod 42 is fastened to a bell crank lever 44. Each bell crank lever 44 is pivotally fastened to the track 11 at 45. The forward riding means 14 on the return stroke bears against an end of the bell crank lever 44 causing it to pivot and lift the rod 42 thereby relieving the pressure of the spring clip 40 from the rearward edge of the stack 12 of copying paper. The block is prevented from too much rearward movement by the rearward riding means 15 engaging the stop 46 on each track 11.

On the underside of the block 13 is affixed a resilient pad 47 (see Figure 3) and to the underside of the pad 47 is stretched the ink-carrying printing medium 48. The printing medium may be affixed to the block 13 or pad 47 in any convenient manner.

*Operation*

To operate the duplicating machine of the present invention, the various parts are positioned as shown in Figure 1. The printing medium 48 is affixed to the block 13, and the stack 12 of the copying paper placed under the spring clip 40. The valve stem 34 is adjusted to dispense the moistening agent 27 to the wick 29 at a suitable rate. The clearance of the moistening roller 30 from the stack 12 is adjusted by means of the cylindrical member 36 as hereinbefore described. The handle 18 and the pressure bar 19 are grasped with one hand and by squeezing same together, the pressure bar bears on the top of the hollow body 22. This causes the moistening device 21 to rotate about its pivots 23 so that the moistening roller 30 is brought down against the stack 12 of copying paper. This pressure causes the roller 30 to ride up slightly in the vertical slots 31 so that the surface of the roller comes into wiping contact with the moistened wick 29. The block 13 and associated parts are then pushed forward along the tracks 11. By maintaining the pressure on the pressure bar 19 during this forward motion, the roller 30 moistens the top sheet of copying paper of the stack 12. This forward motion continues with the forward riding means 14 advancing along the tracks 11 to the slot 16 and the rearward riding means 15 advancing along the tracks 11 and 11*a* to the slots 17. At this point the riding means 14 and 15 fall into the slots 16 and 17 respectively. The block 13 thus travels vertically downward until the ink-carrying printing medium 48 comes in contact with the moistened top sheet of the stack 12 where a mirror reproduction is left.

The pressure is then released from the pressure bar 19 and the block 13 is lifted upwardly and then pushed rearwardly with the riding means 14 and 15 riding along the tracks 11. When the pressure on the pressure bar 19 was released the spring means 24 lifted up and restored the moistening device 21 to its original position so that while the block 13 is pushed rearwardly the moistening roller 30 is clear of the top sheet of the stack 12 and will not smudge the impression that has been left thereon.

When the forward riding means 14 reaches the upstanding arm of the bell crank lever 44, further rearward movement causes the riding means 14 to rotate the lever 44 about its pivot 45 in a clockwise direction thereby causing the rod 42 to lift the spring clip 40. The top sheet which carries an impression left by the printing medium 48 may then be easily lifted off the stack 12.

The apparatus is now in a condition to make a second duplication. The block 13 may be pushed forward again while at the same time reapplying the pressure to the pressure bar 19 so as to bring the moistening roller 30 into contact with the second sheet of copying paper, and the entire process described above can then be repeated.

It will be understood from the above description that I have provided a duplicating machine which is simple in construction and operation.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A duplicating machine comprising a bed arranged to hold at least one copying sheet, a raised track on either side of said bed, a block having a first and second means mounted on each side thereof, an ink-carrying printing medium affixed to the underside of said block; each of said first and second means being arranged to ride on one of said tracks; each of said first riding means being spaced from the second riding means on the same side of the block a predetermined distance; each of said tracks having a first and second downwardly extending slot; each of said first slots being spaced from the second slot on the same track a distance equal to said predetermined distance, and moistening means pivotably mounted on the forward end of said block.

2. A duplicating machine comprising a bed arranged to hold at least one copying sheet, a raised track on either side of said bed, a block having a first and second means mounted on each side thereof, an ink-carrying printing medium affixed to the underside of said block; each of said first and second means being arranged to ride on one of said tracks; each of said first riding means being spaced from the second riding means on the same side of the block a predetermined distance; each of said tracks having a first and second downwardly extending slot; each of said first slots being spaced from the second slot on the same track a distance equal to said predetermined distance, moistening means pivotably mounted on the forward end of said block, said moistening means being biased in an upward direction and comprising a hollow body defining a reservoir containing a moistening agent, a moistening roller journalled in said body, and means arranged to feed said moistening agent to said roller.

3. A duplicating machine comprising a bed arranged to hold at least one copying sheet, a raised track on either side of said bed, a block having a first and second means mounted on each side thereof, an ink-carrying printing medium affixed to the underside of said block; each of said first and second means being arranged to ride on one of said tracks; each of said first riding means being spaced from the second riding means on the same side of the block a predetermined distance; each of said tracks having a first and second downwardly extending slot; each of said first slots being spaced from the second slot on the same track a distance equal

to said predetermined distance, moistening means pivotably mounted on the forward end of said block, and pressure applying means mounted on the uppermost side of said block and arranged to apply downward pressure to said moistening means.

4. A duplicating machine comprising a bed arranged to hold at least one copying sheet, a raised track on either side of said bed, a block having a first and second means mounted on each side thereof, an ink-carrying printing medium affixed to the underside of said block; each of said first and second means being arranged to ride on one of said tracks; each of said first riding means being spaced from the second riding means on the same side of the block a predetermined distance; each of said tracks having a first and second downwardly extending slot; each of said first slots being spaced from the second slot on the same track a distance equal to said predetermined distance, moistening means pivotably mounted on the forward end of said block, pressure applying means mounted on the uppermost side of said block and arranged to apply downward pressure to said moistening means, one end of said pressure applying means being pivotably mounted on the uppermost side of said block whereas the other end engages the upper surface of said moistening means.

5. A duplicating machine comprising a bed arranged to hold at least one copying sheet near one end thereof, a raised track on either side of said bed, a block disposed between said tracks and having a first riding means and a second riding means on each side thereof engaging one of said tracks, an ink-carrying printing medium affixed to the underside of said block; said first riding means and said second riding means being spaced apart a predetermined distance; each of said tracks having a first downwardly extending slot near said end of said bed and a second downwardly slot spaced from said first slot a distance equal to said predetermined distance; said first and second slots arranged to receive said first and second riding means respectively, and moistening means pivotably mounted on the forward end of said block.

6. A duplicating machine comprising a bed arranged to hold at least one copying sheet near one end thereof, a raised track on either side of said bed, a block disposed between said tracks and having a first riding means and a second riding means on each side thereof engaging one of said tracks, an ink-carrying printing medium affixed to the underside of said block; said first riding means and said second riding means being spaced apart a predetermined distance; each of said tracks having a first downwardly extending slot near said end of said bed and a second downwardly slot spaced from said first slot a distance equal to said predetermined distance; said first and second slots arranged to receive said first and second riding means respectively, moistening means pivotably mounted on the forward end of said block, said moistening means comprising a hollow body defining a reservoir containing a moistening agent, a moistening roller journalled in said body, and means arranged to feed said moistening agent to said roller.

7. A duplicating machine comprising a bed arranged to hold at least one copying sheet near one end thereof, a raised track on either side of said bed, a block disposed between said tracks and having a first riding means and a second riding means on each side thereof engaging one of said tracks, an ink-carrying printing medium affixed to the underside of said block; said first riding means and said second riding means being spaced apart a predetermined distance; each of said tracks having a first downwardly extending slot near said end of said bed and a second downwardly slot spaced from said first slot a distance equal to said predetermined distance; said first and second slots arranged to receive said first and second riding means respectively, moistening means pivotably mounted on the forward end of said block, said moistening means comprising a hollow body defining a reservoir containing a moistening agent, a moistening roller journalled in said body, means arranged to feed said moistening agent to said roller, said moistening means being biased in an upward direction and having a pressure applying means bearing against the upper surface thereof so as to act against said biasing.

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