

Nov. 8, 1932.

L. A. TUPPER

1,887,382

DUPLICATING MACHINE

Filed Feb. 26, 1932

Fig. 1.

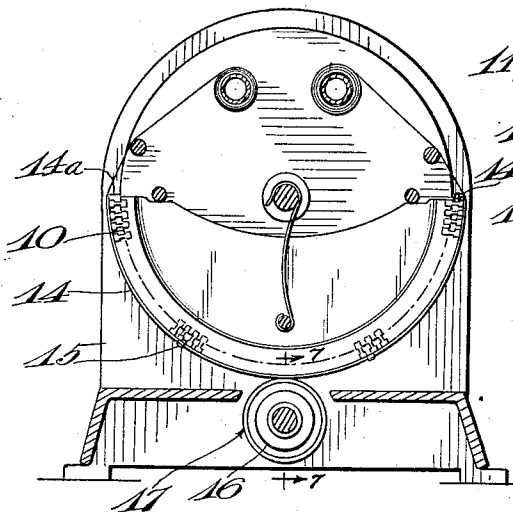


Fig. 2.

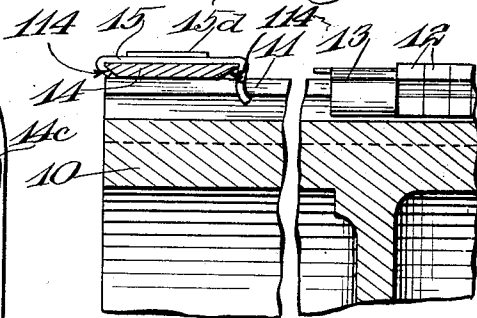
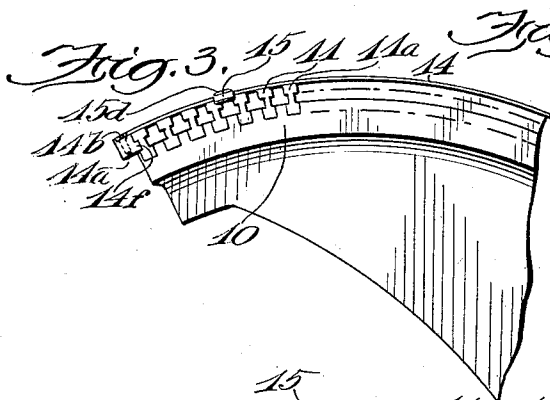


Fig. 5.

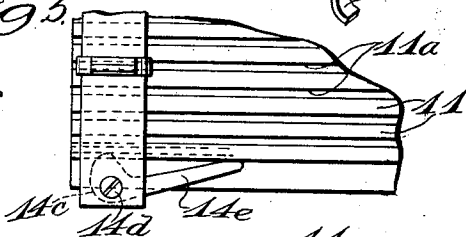
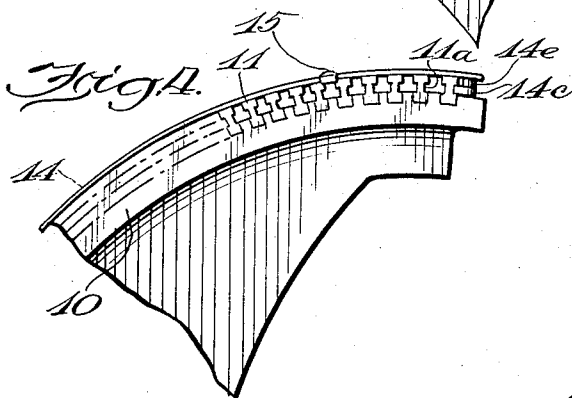
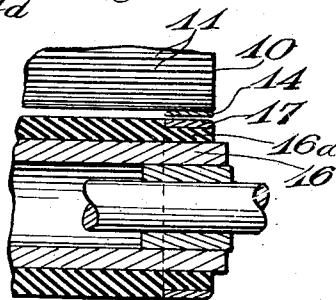


Fig. 7.

Inventor:
Lloyd M. Tupper
By *Stevens & Decheler* Attys.

UNITED STATES PATENT OFFICE

LLOYD A. TUPPER, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO MANIFOLD PRODUCTS COMPANY, OF CHICAGO, ILLINOIS, A PARTNERSHIP COMPOSED OF LLOYD A. TUPPER AND DAVID H. JONES

DUPLICATING MACHINE

Application filed February 26, 1932. Serial No. 595,290.

My invention relates to duplicating machines which print from type and comprise a rotary printing drum having a series of undercut channels in its periphery, extending parallel with its axis to receive type which the drum presents in opposition to an impression platen comprising the other member of the printing couple. As ordinarily accomplished, the printed impressions from such a machine are irregular when the lines of type are less than full length, the type printing more heavily in such instances, because the pressure is variable per unit of length for each line; and the invention has for its main object to provide a simple adjunct for equalizing the printing pressure, whereby the short lines are printed no darker than the lines of full length.

A further object of the invention is to mount the novel equalizing unit beyond the type bearing area of the printing drum, whereby to present no interference to the type or access thereto.

A still further object of the invention is to make the novel equalizing unit quickly attachable upon or removable from the printing drum, and of a nature to be interchangeable relative to standard type printing drums.

Another object of the invention is to construct the novel equalizing unit with means for the handy and easy application of equalizing elements opposite any line of type.

An additional object of the invention is to build the impression platen up with a reinforcement opposite the equalizing unit, whereby to present a firm surface of contact yet preserve the resiliency of the impression.

A final but nevertheless important object of the invention is to design the novel equalizing unit on lines of durability and utmost simplicity.

With the above objects in view and any others that may suggest themselves from the specification and claims to follow, a better understanding of the invention may be had by reference to the accompanying drawing, in which—

Fig. 1 is an end view of a typical duplicating machine showing the application of the novel equalizing unit;

Fig. 2 is an enlarged and inverted cross section of a fragment of the printing drum showing the position of the equalizing unit;

Figs. 3 and 4 are fragmentary end views of the inverted drum, representing the left-hand and right-hand limits thereof;

Fig. 5 is a fragmental plan view of Fig. 4;

Fig. 6 is a perspective view of an equalizing element; and

Fig. 7 is a fragmental section of the couple formed by the printing drum and the impression platen as taken on the line 7—7 of Fig. 1 and showing the equalizing unit therebetween.

Referring specifically to the drawing, 10 denotes the periphery of the conventional printing drum in machines of the type referred to, such periphery being built up with a series of longitudinal type ribs or rails 11 defining spaces 11a in which the type slugs 12 are slid.

Fig. 2 shows a view of such slugs representing spacers and a spring retainer 13 therefor merely for purposes of illustration.

Usually, the lines of type reach considerably short of one end of the printing drum, which may for the present purpose be called the front end, so that a suitable space is left adjacent to such end as clearly shown in Fig. 2. I utilize this space for the wrapping of the drum with a sturdy strap 14 of spring metal, such as brass. At one end, this strap receives a lug 14a from underneath, the same being fastened by screws 14b or other means. The lug 14a is preferably extended inwardly with a tongue 14f, so that it may be hooked over the terminal drum rib 11 to secure the corresponding end of the strap 14, as clearly shown in Fig. 3. After the strap has been closely wrapped over the drum, it is fastened at the other end by means of an eccentric cam 14c which it carries on the under side. This cam is pivoted on a screw 14d and has a lever extension 14e. By reference to Figs. 4 and 5, it will be seen that the lever 14e has been swung to the drum whereby to draw the strap tightly upon the drum and maintain the same secured thereto by the passage of the cam 14c beyond its center line. Of course, other means may be used to se-

cure the strap upon the drum, but these are illustrated as the simplest and most efficient at this time.

The strap 14 is employed to form a base for the elements immediately accomplishing the equalizing function. These elements are in the nature of clips 15 also of spring metal and intended to be positioned transversely upon the strap 14. Each clip 15 is a narrow strip bent down at the ends with hooks 15a and 15b, the latter being extended with an outward stem 15c; also, the clips are built up medially with a longitudinal rib 15d having an abrupt bevel 15e at one side and gradual bevel 15f at the other side, these bevels meeting the side edges of the clip 15.

A supply of the clips 15 goes with each strap 14, and any clip may be mounted upon the strap to assume the position shown in Fig. 2. This is done by undercutting the strap 14 at both side edges in the manner indicated at 114, then engaging the hook 15a of the clip at the front, and finally pressing the clip down to engage the hook 15b at the rear. For equalizing purposes, each clip must occupy a position directly opposite the type groove 11a, as clearly shown in Fig. 5; and the clips are therefore only so wide as to permit the successive grouping thereof if desired line after line. Also, the stem 15c of any clip is sufficiently narrow to enter the groove 11a when the clip is pressed in place, so that the clip is locked in the position set and cannot depart from the line represented by the groove 11a. However, the clip may be removed by the application of a small prying tool, if desired. Fig. 7 shows the position of the strap 14 as carried by the printing drum 10 in opposition to the impression platen 16 of the machine. It will be noted that this platen is mounted with a rubber jacket 16a, this jacket having a slight amount of resiliency. Inasmuch as the clips 15 must come into rolling contact with the periphery of the jacket 16a during the action of the drum and platen, and with some pressure where the spaces representing the short lines of type occur, it must follow that the ribs 15d would impress and soon damage the jacket of the platen. I have therefore reinforced the jacket with a metal band 17, preferably cutting the jacket down sufficiently to permit the band to be pressed on firmly and be disposed flush with the periphery of the jacket.

In the operation of the novel equalizing unit, it will be apparent that a clip 15 is provided for each short line of type. Owing to the fact that the printing pressure varies with the length of the short line spaces, I form the ribs 15d with a height or prominence to correspond. Thus, where the line of type is fairly long, the rib is quite low; and where the line is short the rib is perceptibly higher. Obviously, an assortment

of clips having these variations will be supplied and so marked or colored that it will be an easy matter to apply them as will best suit the conditions in hand.

It is, of course, the function of the clips 15 to serve in the nature of spacing elements due to the function explained above, yet it is my intention that their effect confine itself immediately to the zone of necessity and not that beyond. This zone may be designated as the particular line of type whose pressure is to be equalized, and the equalizing element must not extend its easing effect to the next full line in either direction, as that line will be forced to print too lightly. To this end, I have constructed the clip ribs 15d with the bevels 15e and 15f aforesaid. The bevel 15e occurs on the advancing side of the clip, and therefore gives the latter an early start to relieve the short line pressure. However, the bevel 15f is on the leaving side of the clip and permits the short line pressure to be gradually relieved whereby to smoothly yet fully occasion the normal full line pressure for the next line in printing order.

It will be seen that the novel equalizing unit is a simple attachment which may be easily applied or removed in connection with the standard printing drum. It is outside of the zone of the type or devices to clamp the latter, and is easily accessible. Also, its combination with the reinforced pressure platen assures the firm rolling contact of the strap and its equalizing elements while taking advantage of the resiliency of the pressure platen.

I claim:—

1. An equalizing unit for duplicating machine drums having a plurality of spaced type ribs on the periphery thereof, said unit comprising means mountable upon said type ribs adjacent one end of the drum periphery, and type-pressure equalizing elements applicable to said means.
2. An equalizing unit for duplicating machine drums having a plurality of type ribs on the periphery thereof, said unit comprising means mountable upon said type ribs adjacent one end of the drum periphery, and type-pressure equalizing elements applicable to said means at selected points intermediate adjacent type ribs.
3. An equalizing unit for duplicating machine drums comprising a strap wrapped over one end of the drum periphery, clips mounted transversely upon the strap, and raised surface portions on the clips.
4. The structure of claim 3, said portions being ribs.
5. The structure of claim 3, said portions being ribs extending longitudinally of the drum.
6. The structure of claim 3, said portions being ribs extending longitudinally of the

drum, and of various heights dependent on the extent of equalization necessary.

7. The structure of claim 3, said portions being ribs extending longitudinally of the drum, and whose sides bevel down to the side edges of the clip.

8. The structure of claim 3, said portions being ribs extending longitudinally of the drum, and whose sides bevel down to the side edges of the clip, and the bevels differing radically in slope.

9. An equalizing unit for duplicating machine drums comprising a strap wrapped over one end of the drum periphery, the side edges of the strap being undercut, and clips mounted transversely upon the strap, the end portions of the clips being bent to form hooks engaging said undercut edges.

10. An equalizing unit for duplicating machine drums comprising a strap wrapped over one end of the drum periphery, the side edges of the strap being undercut, and clips mounted transversely upon the strap, the end portions of the clips being bent to form hooks engaging said undercut edges, and of spring material to grip them with tension.

11. An equalizing unit for duplicating machine drums having a plurality of type ribs on the periphery thereof, said unit comprising means mountable at one end of the drum periphery, type-pressure equalizing elements applicable to said means, said means comprising a strap wrapped over the drum periphery and having type rib engaging means at each end thereof.

12. An equalizing unit for duplicating machine drums having a plurality of type ribs on the periphery thereof, said unit comprising means mountable at one end of the drum periphery, type-pressure equalizing elements applicable to said means, said means comprising a strap wrapped over the drum periphery, and type rib engaging devices endwise of the strap to secure the same in position, one of said devices being a hook, and the other a mechanism to draw the strap tight.

13. An equalizing unit for duplicating machine drums, comprising means mountable at one end of the drum periphery, type-pressure equalizing elements applicable to said means, said means comprising a strap wrapped over the drum periphery, and devices endwise of the strap to secure the same to the transverse end portions of the drum, one of said devices being a hook, and the other an eccentric cam operable to draw the strap tight.

14. An equalizing unit for duplicating machine drums and the cushioned impression platens co-operative therewith, comprising means mountable on the drum periphery, type-pressure equalizing elements projected from the surface of such means, and a peripheral reinforcement for said impression

platen and disposed for rolling contact with said elements.

15. An equalizing unit for duplicating machine drums and the cushioned impression platens co-operative therewith, comprising means mountable on the drum periphery, type-pressure equalizing elements projected from the surface of such means, and a band of hard material carried peripherally by the impression platen and positioned for rolling contact with said elements.

16. An equalizing unit for duplicating machine drums having a plurality of spaced type ribs on the periphery thereof defining type line grooves therebetween, said unit comprising means mountable upon said ribs adjacent one end thereof and type pressure equalizing elements applicable to said means at selected points in line with said grooves, said elements having extensions adapted to project into said grooves to retain said elements against displacement transversely of said grooves.

17. An equalizing unit for duplicating machine drums having type ribs upon the periphery thereof, said unit comprising a strap wrapped over the periphery of said drum and extending across said ribs, and type pressure equalizing elements in the form of raised clips applicable to said strap at selected points intermediate the ends thereof and extending transversely thereof.

In testimony whereof I affix my signature.

LLOYD A. TUPPER.