

Oct. 15, 1940.

F. W. STORCK
 DUPLICATING APPARATUS

2,218,304

Filed Dec. 2, 1938

2 Sheets-Sheet 1

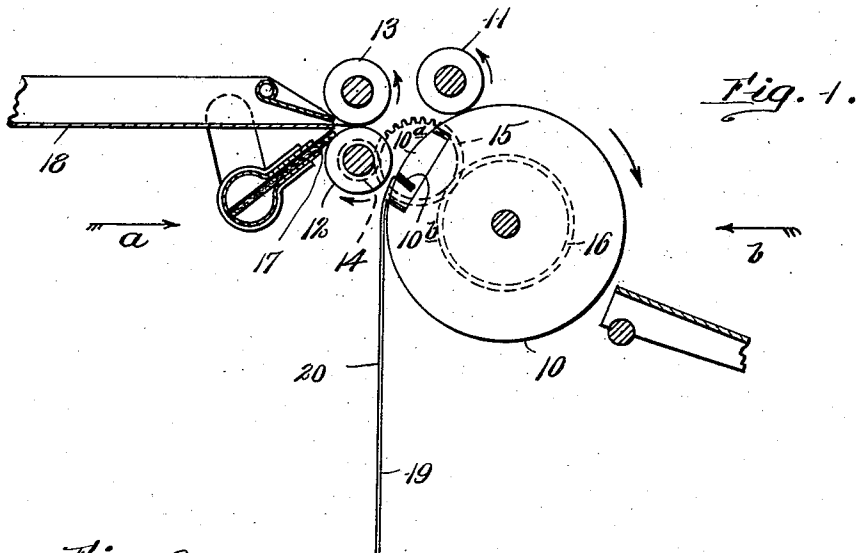


Fig. 2.

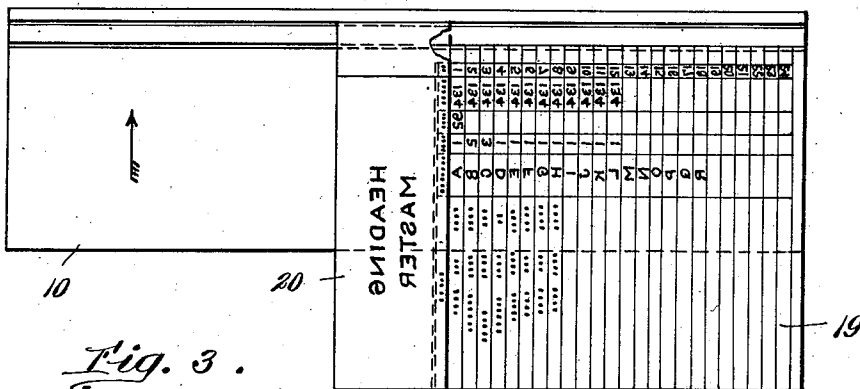
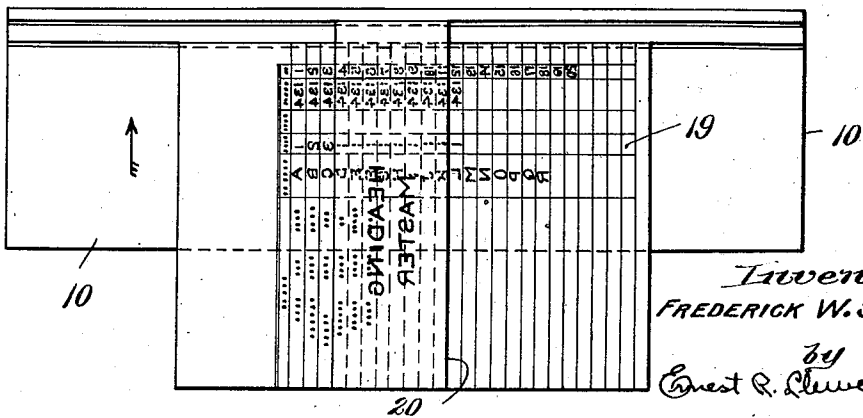


Fig. 3.



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2 Sheets-Sheet 2

Fig. 4.

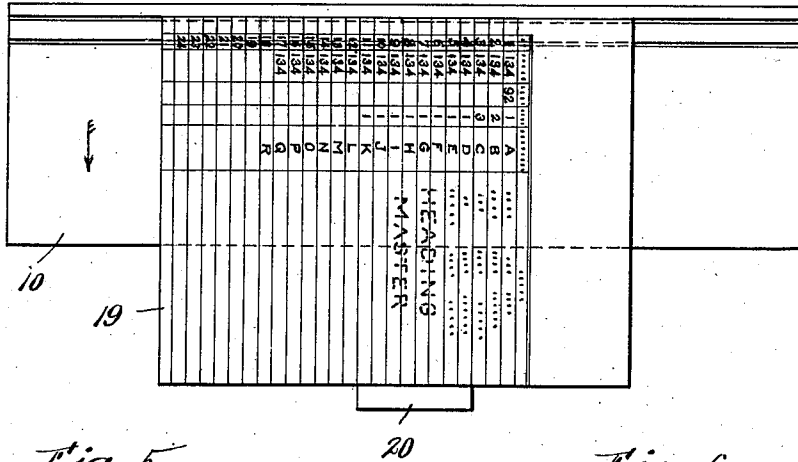


Fig. 5.

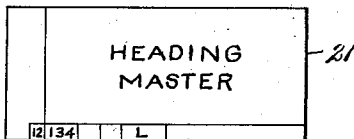
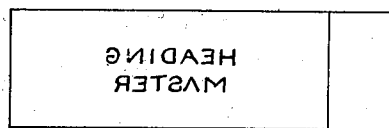
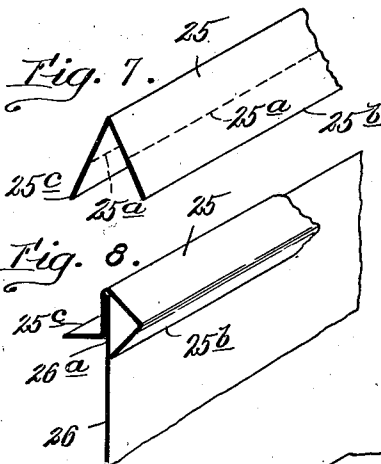
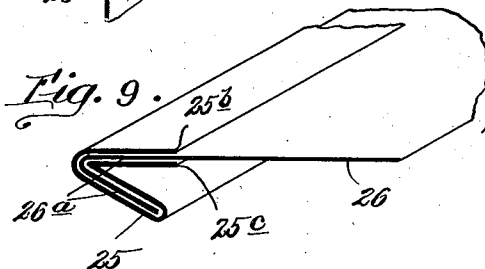
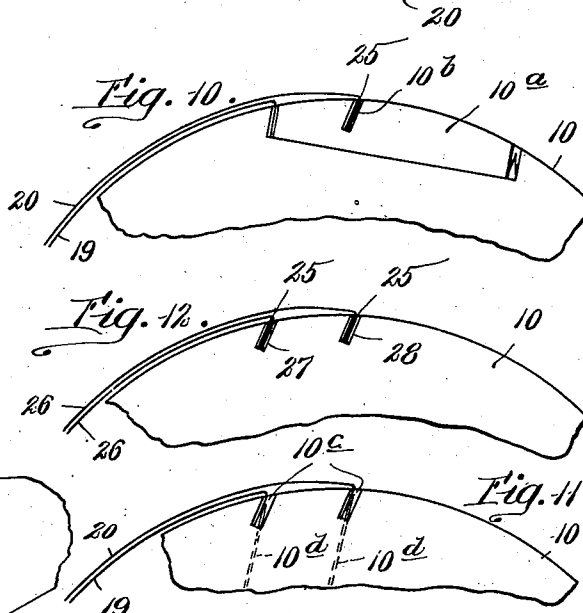


Fig. 6.



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UNITED STATES PATENT OFFICE

2,218,304

DUPLICATING APPARATUS

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8 Claims. (Cl. 101—132.5)

This invention relates to the art of duplicating wherein a master copy sheet is formed with ink characters in reverse and a previously moistened clear sheet or the like (which may be designated as a "copy sheet") is engaged under pressure with the ink characters and whereby a duplicate of the master copy is formed on the copy sheet. More particularly, the present invention is directed to devices and a method for duplicating a selected section of one master copy (hereinafter conveniently referred to as "primary master") simultaneously with a distinctive heading or other subject matter formed on a separate master (hereinafter referred to as a "secondary master").

In the herein referred to art of so-called "wet process" duplicating, the reproducing of the entire subject matter of a master copy upon a copy sheet is now well understood. Further, devices have been proposed for selectively reproducing areas of the master by blocking out undesired portions of the master. Some such devices are illustrated in Patent No. 2,049,877, issued August 4, 1936, to Frederick W. Storck. Other means have been devised to moisten only a portion of the copy sheet so that, when the limited moistened area is engaged with the master, only the portion of the master corresponding to the moistened area will be reproduced on the clear copy sheet. This last mentioned means requires a complicated mechanism with a multiplicity of adjustments and, in both instances, the devices are limited to duplicating subject matter of the single master copy onto the clear moistened copy sheet.

In many instances, a portion of one master is required to be duplicated on a copy sheet and this matter associated with other matter foreign to the master copy. This problem requires two separate and distinct operations; first by passing the copy sheet through the machine to duplicate thereon selected portions of one master and, secondly, passing the copy sheet through the machine a second time to engage with a different master to duplicate thereon desired subject matter of this second master that is to be associated with the already duplicated subject matter of the first master.

An example of such a requirement may be found in numerous order systems such as are employed in factories, and wherein an original order sheet is made out containing a multiplicity of items comprising a complete order. Selected items are taken from the main order and reproduced or posted on an individual order in connection

with a proper heading corresponding to the complete original and embodying required subject matter, and then these separate orders are distributed to the various departments throughout the factory.

Accordingly, one of the principal objects of the present invention is to provide devices whereby items of a master copy may be conveniently and rapidly selected and duplicated simultaneously with a separate proper heading or other desired subject matter.

Another principal object of the invention is to provide a simple device that may be associated with the masters so as to permit them to be readily attached to the printing platen in a manner that allows of their being readily movable relative to one another longitudinally of the platen.

Another object of the invention is to provide a simple and efficient arrangement of parts that may be associated with previously adapted duplicating machines without material change in the machine itself, and whereby selected items of one master may be simultaneously duplicated on a copy sheet with subject matter of a second and separate master.

A further object is to devise a simple method for duplicating selected items of one master simultaneously with subject matter separate from the master that will not require a complicated mechanism and that may be embodied with the usual type of machine adapted and used in making duplicate copies of complete letters or like documents.

The foregoing objects are merely stated as illustrative of the invention and are not to be construed as a limitation thereof, as other objects and advantages will be apparent from the following detailed description of the invention and more particularly set forth in the claims appended hereto and forming a part hereof, which are to be construed as broadly as possible when considered in view of the prior art.

In the accompanying drawings I have shown my invention and a practical embodiment thereof sufficient to enable those skilled in the art to understand the construction and operation thereof, and it is apparent that many modifications and changes may be made therein without departing from the spirit and scope thereof and, therefore, it is to be understood that the invention is not limited to the specific details herein disclosed.

Referring to the drawings:

Fig. 1 is a sectional elevation of a wet process

duplicator with the present invention embodied therewith.

Fig. 2 is a front side elevation of the printing platen, viewing in direction of arrow *a*, Fig. 1, showing the primary and secondary master copies attached thereto.

Fig. 3 is a view corresponding to Fig. 1, but shows the master copies in a different relative position.

Fig. 4 is a rear side elevation of the printing platen, looking in direction of arrow *b*, Fig. 1, as would be viewed when the platen has been rotated to carry the attached ends of the masters to this side of the platen.

Fig. 5 is a detail of an impressed copy sheet. Fig. 6 is a detail of a secondary or heading master copy.

Fig. 7 is a detail of the master copy sheet sub-holder element.

Fig. 8 is a view of the sub-holder element partially assembled with the margin of a master copy sheet.

Fig. 9 illustrates the sub-holder element in its folded position with the margin of the master copy sheet constrained thereby.

Fig. 10 is an enlarged view of a fragmentary portion of the printing platen shown at Fig. 1 and illustrating the master copy clamp bar.

Fig. 11 is a view corresponding substantially to Fig. 10, but shows means for attaching the master copies to a printing platen that is not provided with a clamp bar.

Fig. 12 is another modified form for attaching the master copies to a printing platen.

The duplicating machine

A practical embodiment of the present invention is illustrated in association with a duplicating machine having a rotatable printing drum or platen 10 with means (not shown) for rotating the platen as desired. The machine is also provided with a pressure roller 11 that engages with the peripheral face of the printing platen 10.

The feed rollers 12, 13 are disposed in front of the printing platen 10 and are rotated in unison with the platen by means of a pinion 14 associated with the roller 12. This pinion 14 meshes with an intermediate gear 15 that, in turn, meshes with and is driven by a gear 16 associated with the printing platen 10.

In the present instance, the lower roller 12 functions as a combined feeding and moistening roller as, when this roller is rotated, it receives a film of moisture from a fibrous material 17 that engages with the face of the roller 12. Moisture is supplied to the fibrous material 17 in a suitable manner from a fluid supply.

Copy sheets are fed from the support 18 and engaged between the feed rollers 12, 13 and, as these rollers are rotated, one face of the copy sheet is moistened as the sheet is advanced to be subsequently engaged between the printing platen 10, having the master copy attached thereto, and its coacting pressure roller 11.

A "wet process" duplicating machine of the above general character is completely shown and described in Reissue Letters Patent 19,951, issued April 28, 1936, to Frederick W. Storck; therefore, further detailed description is thought to be unnecessary, although it is to be understood that the invention is not limited to a duplicating machine of this specific construction.

The master copies

It is now well understood that in the so-called art of "wet process" duplicating, the master copy is formed with ink characters formed in reverse and these characters consist of what may be conveniently termed—slight mounds of a dissolvable copying ink. When a clear moistened copy sheet is engaged under pressure with these character mounds, sufficient of the ink is dissolved to reproduce a duplicate of the master upon the copy sheet.

The illustrated "primary master" comprises line-by-line items that may be numerically or otherwise arranged as a complete master 19. A marginal edge of this primary master 19 may be suitably attached to the platen 10 as by means of a clamp bar 10*a*, Figs. 1 and 10, with the reverse characters facing outwardly and the lines extending circumferentially of the drum, see Figs. 2 and 3.

A "secondary master" 20 of a less area than the primary master is formed, as previously mentioned, with its subject matter in reverse. This secondary master 20 is attached to the printing platen in a superimposed relation to the primary master 19 and in a manner that may be used to block out a portion of the subject matter on the primary master 19.

These master copies may be adjusted relative to one another lengthwise of the drum so that the subject matter of the secondary master 20 will be duplicated each time with selected subject matter or items of the primary master 19 that are disposed adjacent to the edge of the secondary master. To accomplish this purpose, the copy sheet 21 is formed of an area or width equivalent to the desired area of the subject matter on the secondary master 20, together with the portion to be selected of the primary master 19.

At Fig. 2 the primary master 19 and the secondary master 20 are shown positioned to reproduce a duplicate of the secondary or heading master 20 and the first item of the primary master 19. At Fig. 3 the masters are shown in a relative position so that the copy sheet 21, see Fig. 5, will receive a duplicate of the master 20 and the twelfth item of the master 19. In this manner, as the copy sheet is guided to the feed rollers 12, 13, and in a positioned relation to the secondary master 20, the copy sheet is moistened and engages completely with the area embodying the subject matter or width of the master 20 which, in many of its operative positions, functions to block out underlying items of the primary master and permits the duplicating of only such items of the primary master 19 as may engage directly with the moistened copy sheet 21.

Attaching master copies to the printing platen

In utilizing the foregoing method of producing duplicate copies, it is obvious that various means may be employed to attach the master copies to the printing platen. Many machines already in use at present are provided with a clamp bar 10*a* as illustrated at Figs. 1 and 5 and are provided with an auxiliary slot 10*b* for the attachment of a block-out pattern, as fully shown and described in U. S. Letters Patent 2,049,877, issued August 4, 1936, to Frederick W. Storck.

Again, the printing platen 10 may be provided with a pair of longitudinally extending slots 10*c* 75

as illustrated at Fig. 11, and in which the marginal edge of the master copy may be inserted and restrained by clamping members 10d disposed in the slots. Such a clamping device is shown and described in U. S. Letters Patent 2,093,385, issued September 14, 1937, to Frederick W. Storck.

Master copy sub-holder

Obviously, in using a method of the herein described character, convenience and simplicity are of the utmost importance and the master copies should be arranged to be easily attached and readily adjusted relative to one another. To accomplish these objectives, I have provided an element that functions as a sub-holder for the master copy and is adapted to be engaged with a marginal edge of a master copy and in a manner to constrain the marginal edge and, at the same time, to increase the thickness of the margin in cross-section and in a substantially expandible form.

Preferably, the sub-holder element 25, see Fig. 7, is formed of a flexible material; for example, heavy paper of lightweight cardboard or the equivalent, having a V-shaped cross-section. The opposed side portions of the V-shaped element may be lightly scored as at 25a for the purpose of bending a part of these portions back against the element in the form of pleats.

A margin 26a of a master copy 26 is inserted into the V-shaped element, see Fig. 8, and the portions 25b, 25c thereof, together with the margin 26a, are then bent in the form of pleats as illustrated at Fig. 9 to constrain the master copy in the element that forms the sub-holder 25. As the sub-holder 25 is preferably formed of a flexible material, it is obvious that when folded in the form of pleats, as illustrated at Fig. 9, the holder 25 will have a degree of expansibility in cross-section such as would be inherent with pleated paper or the like.

Master copies 26, each provided with a sub-holder 25, may be easily inserted in slots 27, 28, see Fig. 12, in the printing platen, and the expanding tendency of the holder will frictionally engage with the side walls and tend to restrain the holders in the slots and, at the same time, permit the holders to be readily moved lengthwise in the slots. This permits of the masters being conveniently positioned relative to one another for the purpose previously described in simultaneously duplicating subject matter contained on both masters. It is to be noted that the secondary master copy 20 illustrated at Figs. 1 and 10 is provided with a sub-holder 25 that engages in the slot 10b formed in the clamp bar 10a.

These sub-holder elements 25 are readily removable from the master copies and this permits of the masters being conveniently filed in an orderly manner for future reference or use, and the sub-holders themselves may be re-used in other masters.

From the foregoing, it is obvious that the marginal edge of the master sheet may itself be pleated to function in the intended manner and within the scope of the present invention, although such an arrangement would be lacking the simplicity and convenience attributable to the separate sub-holder in the preparing of a master copy for attachment to the printing platen.

Having thus described the invention, what I claim is:

1. In the art of duplicating directly from a master copy sheet having ink characters formed in reverse and engaging a moistened copy sheet therewith; the method of simultaneously duplicating selected portions of a primary master in combination with subject matter separate from said primary master that includes, superimposing a secondary master copy relative to a portion of said primary master, selectively moving said primary master so that a portion thereof, adjacent said secondary master, will be simultaneously duplicated with the subject matter of said secondary master upon a previously moistened sheet or the like of a width corresponding substantially to the desired subject matter to be duplicated.

2. In the art of duplicating directly from a master copy sheet having ink characters formed in reverse and engaging a moistened copy sheet therewith; the method of selectively duplicating portions of a primary master simultaneously with subject matter separate from said primary master that includes, superimposing a secondary master copy relative to a portion of said primary master, selectively moving one of said masters relative to the other so that said secondary master copy and a portion of said primary master copy adjacent said secondary master copy will be duplicated upon engagement with a previously moistened sheet or the like of a width corresponding substantially to the desired subject matter to be duplicated.

3. A sub-holder for a master copy sheet comprising a non-metallic flexible V-shaped element having portions thereof bendable back upon themselves to form pleats adapted to detachably constrain a margin of the master copy therein and effect a greater thickness of said element and end portion of the master copy in cross-section.

4. A sub-holder for a master copy sheet comprising a flexible element of a substantially V-shape in cross-section and adapted to receive a margin of the copy sheet in a substantially free manner, said element having portions thereof adapted to be bent in a manner to increase the thickness of said element and margin in cross-section whereby said margin is temporarily secured to said element in a readily detachable manner.

5. A sub-holder for a master copy sheet comprising a flexible fibrous element normally having a substantially V-shaped portion adapted to receive a margin of the copy sheet, said element having portions thereof adapted to be bent in the manner of pleats to increase the cross-sectional thickness of said element and temporarily restrain said margin and whereby said element is expansible in the cross-sectional direction of said pleats.

6. In the wet process art of duplicating wherein a master copy sheet is provided with ink characters formed thereon in reverse and a substantially clear previously moistened copy sheet is engaged therewith; the method of preparing said master copy for attachment to a printing platen that includes forming expansible pleats in association with a marginal portion of said master and in a manner that increases the thickness of an edge portion of said master.

7. In the wet process art of duplicating wherein a master copy sheet is provided with ink characters formed in reverse and a substantially clear previously moistened copy sheet is engaged therewith; the method of preparing said master copy for connection to a printing platen that includes increasing the thickness of a marginal portion

and folding said increased portion in a manner of pleats adapted to temporarily constrain said marginal portion and further increase the thickness thereof and whereby said folding develops an area having expansible characteristics relative to the cross-section of said pleats.

3. In the wet process art of duplicating wherein a master copy sheet is provided with ink characters formed thereon in reverse and a substan-

tially clear previously moistened copy sheet is engaged therewith; the method of preparing said master copy sheet for attachment to a printing platen that includes increasing the thickness of a marginal portion of said master and bending said increased portion back upon itself in the manner of pleats having an inherent expanding action relative to their cross-section.

FREDERICK W. STORCK.