June 13, 1933. W. C. HUEBNER 1,914,126

PROCESS OF PREPARING PRINTING FILMS

Filed Oct. 16, 1930 2 Sheets-Sheet 1

Fig. 1.

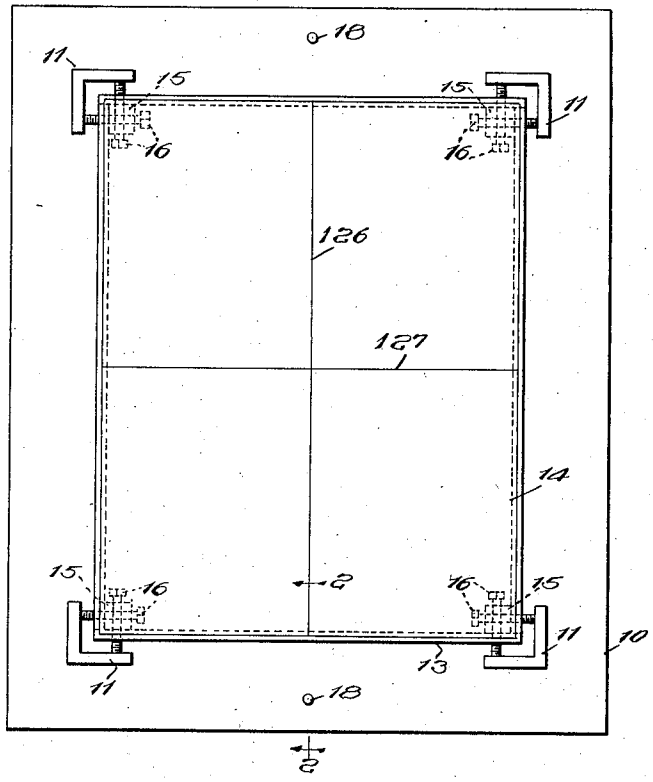


Fig. 2.

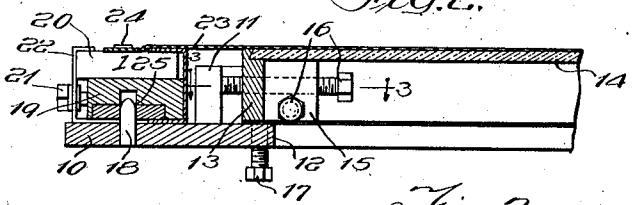
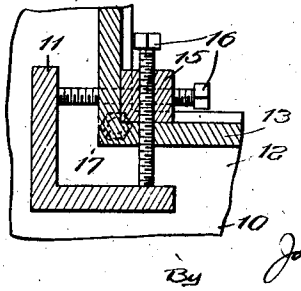


Fig. 3.



Witness:
William P. Kilroy

Inventor:
William C. Huebner
By Joseph Harris
His Attys.

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Fig. 4.

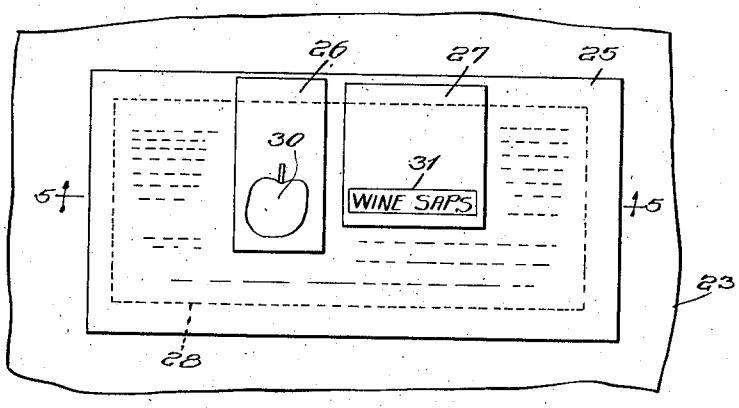


Fig. 5.

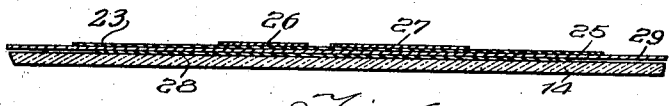


Fig. 6.

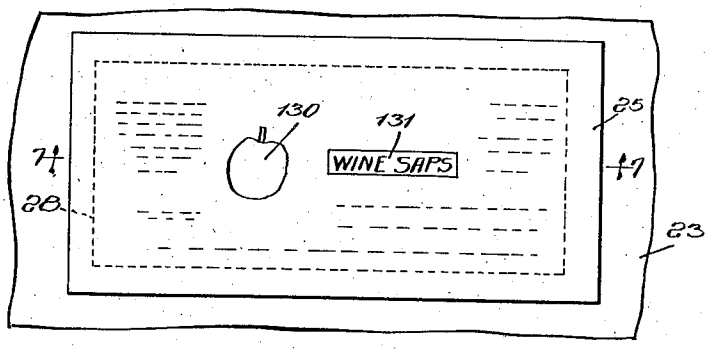
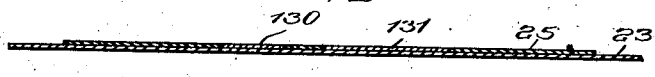


Fig. 7.



Witness:
William P. Kilroy

Inventor:
William C. Huebner
Joseph Harris
Its Atty.

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Patented June 13, 1933 1,914,126

UNITED STATES PATENT OFFICE

WILLIAM C. HUEBNER, OF CHICAGO, ILLINOIS

PROCESS OF PREPARING PRINTING FILMS

Application filed October 16, 1930. Serial No. 489,093.

This invention relates to improvements in process of preparing printing films.

In the use of press plates for photo-lithographic printing, it is highly desirable that the entire available area of the press plate be utilized in order that the time and labor of make-ready of the press and the time and labor involved in the preparation of the plate itself, be kept at a minimum. In certain classes of printing, the size of the subject or image to be printed is relatively small, as for instance, in the case of labels for canned goods, box covers and the like. In the case of such prints, the quantities involved are generally not sufficient to warrant utilizing the entire area of the press plate for multiple or duplicated reproductions of such small sized prints because the "run" of the plate and printing press would be too short for economical production. It is for this reason, therefore, that, when small prints such as labels and box covers and the like are to be printed a number of different subjects or images are used on the press plate to fill the entire area thereof so that long runs can be made, thus reducing the number of press plates to be developed and the time and labor of make-ready on the press.

Further, many printing establishments utilize what are known as "photo composers" or "photographic printing machines" in preparing the press plates, that is, in transferring photographically from suitable negatives, the several subjects or images that are to be printed. Such photo composing or photographic printing machine equipment is comparatively expensive and it is highly desirable from an economical standpoint that the same be kept in constant use as far as possible. In conjunction with such photo composing machines, it is necessary to use registering devices or machines, that is apparatus suitable for accurately locating and positioning the various negatives or printing plates in their respective holders, which holders are later used on the photo composing machine proper to photograph the images or subjects onto the press plate. Where a large number of small subjects or images are to be reproduced, each requiring mounting of the corresponding negative in a separate holder, it is desirable from an economical standpoint, that the registration of the negatives in their respective holders be done sufficiently in advance of the use of the holders in the photo composing machine as to prevent any delay in the photographing process and consequently, for efficient production, a large number of holders are desirable. With many printing jobs, particularly labels for canned goods and the like, it has also been found that a quantity of labels will be required, part of which will differ only slightly from others, as for instance, labels put out by a single firm for a line of canned goods, such as apples, pears and peaches will be the same in major part but will differ as to the illustration of the particular fruit with which the label is used and a corresponding slight change in reading matter on the label. Much difficulty and expense has heretofore been encountered in preparing printing films or plates and obtaining accurate register thereof, in work of the type indicated.

One object of my invention, therefore, is to provide a labor and time saving process of preparing printing films and more particularly printing films which are of themselves "composed" or built up by combining portions from different subjects or originals.

Another object is to provide a process of the character indicated in the preceding paragraph, which is particularly adapted for small size subjects or images such as labels for canned goods, box covers and the like, where a quantity is required, a part of which may differ only slightly from others, but each of which necessitates the preparation of a printing film incorporating the differences or changes one over the other.

A further object of the invention is to provide a process of the type hereinbefore indicated, wherein a number of composed printing films or negatives may be obtained corresponding to the several color separations with accurate registry, without the necessity of the usual register marks on the originals or impressions or any of the component parts entering into the ultimate composed printing film or negative.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings, forming a part of this specification, I have illustrated suitable apparatus for carrying out my improved process. In said drawings, Figure 1 is a top plan view of a suitable support having register means co-ordinated with the photographic printing machine with which the films to be made up are adapted to be used. Figure 2 is an enlarged, vertical, sectional view corresponding to the line 2—2 of Figure 1. Figure 3 is a horizontal, detailed, sectional view corresponding to the line 3—3 of Figure 2. Figure 4 is a diagrammatic view illustrating the manner of building up or composing a film for printing a label. Figure 5 is a sectional view, corresponding to the line 5—5 of Figure 4, the scale being appreciably enlarged in order to more clearly illustrate certain features of the process. Figure 6 is a view similar to Figure 4, illustrating the condition of the film after certain additional steps have been taken. And Figure 7 is a sectional view corresponding to the line 7—7 of Figure 1, upon an enlarged scale.

In carrying out my invention, I preferably use a frame having a glass table or support, the same comprising a rectangular open frame proper 10 having, near the four corners thereof, upstanding right angular flanges 11—11, the latter being offset outwardly from the inner edges 12 of the opening in the frame proper 10. Disposed within the rectangular space defined by the four corner sets of flanges 11—11, is a secondary open rectangular frame 13 to which is secured, by any suitable means, a glass plate or table 14. The frame 13 is preferably provided with reinforcing blocks 15 at its inner corners, through each of which are threaded two adjusting bolts or screws 16—16, arranged at right angles to each other and the ends of which are adapted to engage the corresponding angular corner lug 11—11 so that, as will be evident from Figures 1 and 3, the frame 13 with its glass table 14 may be adjusted vertically and horizontally, as viewed in Figure 1, and retained in any desired adjusted position by setting the adjusting screws or bolts 16—16. Preferably also the frame 13 is adapted for vertical adjustment by four corner adjusting screws or bolts 17 that are threaded up through the main frame 10 and engage the corners of the frame 13, as shown in Figures 2 and 3. The reason for the vertical adjustment is to bring the top surface of the glass 14 at the desired height, corresponding to the film frames and films carried thereby, hereinafter referred to.

The frame 10 is provided with registering devices similar to and co-ordinated with those on the photo composer or photographic printing machine in connection with which my process is adapted to be carried out. In the instance shown, these register means comprise two dowel pins 18—18 accurately positioned and located on two opposite sides of the main frame 10.

In carrying out my improved process, I preferably use film frames of the type disclosed in my co-pending application, Serial No. 488,012, filed November 11, 1930, now Patent 1,860,389, granted May 31, 1932. A section of one of these is indicated in Figure 2, wherein the film holder comprises a rectangular frame 19 on which are slidably mounted on each side thereof, a plurality of film attaching, preferably wood, blocks 20, the latter being adjusted inwardly and outwardly toward the center opening of the frame 19 by adjusting screws 21 having swiveled connection with metal carriers 22, which in turn are attached to the blocks 20. The film 23 is secured around all of its edges to the several blocks 20 by any suitable means such as the staples 24, all as will more clearly appear from reference to my said co-pending application. To co-ordinate the film holder with the frame 10, the film holder will be provided with two dowel holes 125 located and positioned to cooperate with the dowel pins 18 so that, when any film holder is placed on the table 10 over the dowel pins 18, the same will occupy a predetermined position and location, which will be identical for all the film frames used.

In carrying out my process, the table plate 14 will be provided with two fine lines 126 and 127 inscribed thereon, which two lines will be exactly at right angles to each other and intersect at the center of the glass table 14. To register said lines 26 and 27 as to position and location with reference to the dowel pins 18, I first take a film holder, such as shown, having a film attached thereto and place it on the photo composing or photographic printing machine in known position and location, it being understood that said machine will have dowel pins corresponding to those referenced 18 in the drawing. The holder with its film is then placed against a press plate in the machine, which has first had inscribed thereon two travel lines corresponding to the horizontal and vertical movements of the parts of such machine. Preferably, said two inscribed travel lines will intersect at the middle of each of the horizontal and vertical travel lines of the machine and the point of intersection of said scribed lines will also be the center of rotation so that the exposures may be accurately made as to position as well as location, in either head up, head down, head right or head left, as may be required by the particular job. With the film placed against such inscribed press plate, four very fine holes will then preferably be punched or pricked

into the film, two of said holes coinciding with one of the travel lines and the other two with the other travel line, said four holes thus determining two imaginary lines on the film corresponding exactly with the two travel lines of the photographic printing machine. The film holder with its punched or pricked film is then placed on the frame 10, as shown in Figure 2, the film lying on the glass table 14. The latter is then suitably adjusted until its two lines 126 and 127 are brought into exact register with the respective four holes of the film. When this has been accomplished, the position and location of the glass table 14 is then fixed by setting the screws 16, whereupon the two lines 126 and 127 will have been accurately co-ordinated with reference to the dowel pins 18 and the travel lines of the photographic printing machine with which the films made by my improved process are to be used. The film holder is then removed.

After the glass table 14 has thus been placed in registered position, I paste thereon in as nearly centered position as possible, the original sketch, subject, image, label or box cover, which it is desired to have reproduced by printing. Such image, subject, label or the like will be pasted so that the point of intersection of the lines 126 and 127 will coincide, as nearly as may be, with the physical center of such subject or image. Said pasted image, subject, label or the like may now be termed the "key" to be used in carrying out the rest of the process.

Next, I take a film holder with a plan film secured thereto, such as illustrated in Figure 2, of the drawings, and mount said film holder on the frame 10 in registered position by means of the dowel pins 18 and dowel pin holes 125. The film holder, just referred to, may be the same holder as that previously mentioned or a similar holder and the film may be the one previously used with the punch marks, although preferably the film will be a new unperforated film. Because of the transparency of the film, it is evident that the "key" will be readily visible therethrough. Assuming that the "key" or original, the prints of which are to be reproduced, is a composed original or key such as a label for canned goods, the same may comprise the greater part of a label theretofore used with a picture of an apple inserted therein and an insert of reading matter corresponding to the apple contents. With the film in place as just above described, an impression taken from the original stone or plate of the main label proper will be loosely pasted down on the film, as indicated at 25 in Figure 4. This impression will be taken on a specially prepared thin paper and before loosely pasting it down will be registered accurately with the key carried by the glass table 14, the registration being effected by sighting through the impression onto the key. When so registered, it will be lightly pasted on the film at suitable spaced points. Next, a similar impression from the original stone or plate having the desired picture of an apple to be incorporated in the film, will be loosely pasted over the impression 25, as indicated at 26, the apple or other image on such secondary impression being in turn registered through the impression 25 with the corresponding apple or other image on the key or original carried by the glass table 14. Similarly, a corresponding impression 27 of the changed or different reading matter will be loosely pasted over the impression 25, as indicated in Figure 4, said reading matter or other corresponding image being registered through the large impression 25 with the key carried by the glass table 14. In pasting the subordinate or secondary impressions 26—27 (and it will be understood that these may vary in number), they will preferably be loosely pasted down outside of the area of the main impression 25.

Next, as best illustrated in Figure 5, where the key or original sketch, label or the like is shown in section at 28 pasted on the glass table 14, I insert between the impression 25 and film 23 a suitable sheet 29, preferably fairly heavy celluloid. Thereupon, as with a sharp razor or other suitable cutter, I cut around the outlines of the apple 30 and printed matter proper 31, cutting them out of the corresponding impressions 26 and 27 and simultaneously cut out from the main impression and immediately therebeneath corresponding outlines of exactly the same dimensions and contour. The cutouts so made in the main impression 25 (the celluloid strip 29 preventing injury to the film 23) are then removed and the corresponding cutouts of the apple and printed matter 30—31 are then substituted in the corresponding openings left in the impression 25, this condition of the film being best indicated in Figure 7, where the apple cutout is indicated at 130 and the printed matter cutout at 131. The undesired portions of the impressions 26 and 27 are then removed and also the celluloid strip or sheet 29, whereupon the main impression 25 and the cutouts 130 and 131 of the subordinate or secondary impressions are firmly pasted down on the film 23 to the condition illustrated in Figure 7. As will be evident, a composed negative or printing film has thus been built up, all component parts of which, including the inserts, are in exact registry with the key or original subject or label, or the like, that is carried by the glass table 14. Not only is the composed impression on the film 23 thus registered with the key, but the position and location of the composed impression on the film has a predetermined position and location with reference to the register devices

18—18 and consequently with the corresponding register devices of the photo composing machine proper. The film holder with its composed impression may then be used on the photo composing or photographic printing machine and accurate register obtained.

The process so far described is applicable to either black and white work or for one color separation. If a number of color separations are to be employed for the same subject, image or label, the set of impressions applied to the film, as above described, will be for one color only. A similar procedure will be followed on different films carried by similar holders, the composing and registration being effected in identically the same manner and always working from the same original key carried by the glass table 14. In this manner, a series of color separation composed printing films may be readily and quickly prepared, all being in predetermined, known registered position and location and all adapted to be used on the photographic printing machine. It will further be observed that in the carrying out of my process, as above described, none of the usual register marks are required, so that the composed films may be made by taking impressions from old stones or plates, whether or not the same have any register marks, such as customarily used in work on photographic printing machines.

In the preceding description, the composed printing film has been described as made up from a series or plurality of impressions on specially prepared paper. In certain classes of work, the "key" secured to the table may be in the form of a sketch wherein a part of the image or subject consists of half-tone, another portion stippled, another portion crayon lined, a border all of one color, another portion of one color within the confines of which may be black or other different color. In such cases, the same improved process is still used and accurate register obtained on the printing films. With the film in a holder and mounted in registered position as previously described, the operator may apply directly on the film a cutout of half-tone to be positioned accurately over the corresponding portion of the key sketch. Similarly the stippling and crayon lines may be applied directly by hand to the film in exactly superposed position over the corresponding portions of the key sketch; an opaque pigment applied directly to the printing film corresponding with the border portion of the key sketch; an opaque pigment applied directly to the printing film corresponding to the color patches or proposed color patches of the key sketch; and the lettering applied within the confines of the color portions all in exact position and location corresponding to the original key sketch. The features in this paragraph described may also be combined in various combinations with the use of impressions such as described in the earlier part of the specification. In any combination of the steps, it is evident that a series of color printing films may be made, all having exact register with the original key subject or sketch.

In the foregoing, my improved process has been described with reference to certain specific conditions commonly arising in the trade but, as will be obvious, the steps of the process are equally applicable to other specific conditions and particularly with small size work. The process is simple, easily and quickly carried out, permits of the making up of a number of different subjects all to be printed from the same press plate, and insures accurate registration whether the printing be done in one or more colors. Among other very important advantages is the one that my improved process eliminates the necessity of attempting to register on the usual registering machine each of the several component parts of the composed printing film, this feature alone involving a saving of approximately 75% of the time heretofore required in doing similar work.

The process herein described has been with particular reference to so-called photo composing or photographic printing machines, wherein pressure and light action are used. My process, however, may be employed in the making up or composing of printing films of other types where the desired transfers of the images or subjects from the printing film to the press plate are made otherwise than photographically.

I have herein described what I now consider the preferred manner of carrying out the invention, but I am aware that various changes and modifications may be made without departing from the spirit of the invention and all such changes and modifications are contemplated as come within the scope of the claims appended hereto.

I claim:

1. The herein described process of preparing a composed printing film which includes: placing in predetermined position on a support, a copy of the subject to be reproduced; superimposing a film over said subject copy while the film is attached to a holder retained in predetermined position and location with respect to the subject copy; applying to the film an impression of the subject and registering it thereon by accurately superimposing it over the subject copy.

2. The herein described process of preparing a composed printing film which includes: placing in predetermined position on a support, a copy of the subject to be reproduced; superimposing a film over said subject copy while the film is attached to a holder retained in predetermined position and location with respect to the subject copy; applying to the

film an impression of the major part of the subject and registering it thereon by accurately superimposing it over the subject copy; loosely temporarily securing the subject impression to the film; loosely temporarily securing in place over the subject impression, a subordinate impression and registering it with respect to the subject copy; then cutting out from the subject impression so much thereof as corresponds in size and location to the subordinate impression; then permanently securing the subject impression and the subordinate impression to the film.

3. The herein described process of preparing a composed printing film which includes: placing in predetermined position on a support, a copy of the subject to be reproduced; superimposing a film over said subject copy while the film is attached to a holder retained in predetermined position and location with respect to the subject copy; applying to the film an impression of the major part of the subject and registering it thereon by accurately superimposing it over the subject copy; temporarily securing the subject impression to the film; temporarily securing in place on the subject impression, a plurality of subordinate impressions and registering the same with respect to the corresponding portions of the subject copy; then making duplicate cutouts in the subject and subordinate impressions and replacing the cutouts from the subject impression with the corresponding cutouts from the subordinate impressions; and finally permanently securing the subject impression and subordinate cutout impressions to the film.

4. The herein described process of preparing a composed printing film which includes: placing in predetermined position on a support, a copy of the subject to be reproduced; superimposing a film over said subject copy while the film is attached to a holder retained in predetermined position and location with respect to the subject copy; applying to the film an impression of the major part of the subject and registering it thereon by accurately superimposing it over the subject copy; temporarily securing the subject impression to the film; temporarily securing in place over the subject impression a subordinate impression and registering the latter with respect to the corresponding portion of the subject copy; inserting a shield between said subject impression and the film, making corresponding duplicate cutouts in the subject and subordinate impressions and replacing the cutout of the subject impression by the corresponding cutout of the subordinate impression; removing the shield; and permanently securing the subject impression and subordinate cutout impression to the film.

5. The herein described process of preparing a composed printing film which includes: placing in predetermined position on a support, a copy of the subject to be reproduced; superimposing a film over said subject copy while the film is attached to a holder retained in predetermined position and location with respect to the subject copy; applying to the film an impression of the major part of the subject and registering it thereon by accurately superimposing it over the subject copy; temporarily securing the subject impression to the film; temporarily securing over the subject impression a plurality of subordinate impressions and registering the latter with respect to the corresponding portions of the subject copy; inserting a shield between the subject impression and the film; making duplicate cutouts in the subordinate and subject impressions; removing the shield and the cutouts of the subject impression; and then substituting the cutouts of the subordinate impressions for the corresponding cutouts of the subject impression and permanently securing the impressions to the film.

6. The herein described process of preparing a composed printing film which includes: placing in a predetermined position on a support, a copy of the subject to be reproduced; superimposing a film over said subject copy while the film is attached to a holder retained in predetermined position and location with respect to the subject copy; applying to the film an impression of the major part of the subject and registering it thereon by accurately superimposing it over the subject copy; temporarily securing said major impression in said registered position; temporarily securing in place over said major impression, a subordinate impression and registering it by superimposing it over the corresponding portion of the subject copy; then cutting out from the major and subordinate impressions duplicates of the desired portion of the subordinate impression; replacing the cutout of the major impression by the cutout of the subordinate impression; and finally permanently securing the retained impressions to the film.

7. The herein described process of preparing a color series of corresponding composed printing films which includes: placing in predetermined position on a support, a copy of the subject to be reproduced; superimposing a film over said subject copy while the film is attached to a holder retained in predetermined position and location with respect to the subject copy; temporarily applying to the film one color separation impression of the major part of the subject and registering it with the subject by accurate superposing; similarly temporarily securing and registering a like color separation subordinate impression over said major impression; making duplicate cutouts in the major and subordinate impressions corresponding to the desired portion of the subordinate impression; re-

placing the cutout of the major impression by the cutout of the subordinate impression; permanently securing said impressions to the film; and similarly preparing each other desired color separation printing film by utilizing the same subject copy.

8. The herein described process of preparing a color series of printing films which includes: placing in predetermined position on a support a copy of the subject to be reproduced; superimposing a film over said subject copy while the film is attached to a holder retained in predetermined position and location with respect to the subject copy; applying to the film one color impression of the subject and registering it with the subject by accurate superimposing; securing said impression to the film; and preparing the remaining color printing films similarly by using the same subject copy.

9. The herein described process of preparing a color series of composed printing films which includes: placing in predetermined position on a support, a copy of the subject to be reproduced; superimposing a film over said subject copy while the film is attached to a holder retained in predetermined position and location with respect to the subject copy; applying to the film one color impression of the major part of the subject and accurately superimposing said impression over the subject copy and temporarily securing the impression to the film; superimposing and loosely securing on said major impression and accurately superposed over the subject copy one or more like color subordinate impressions; making duplicate cutouts from the major and subordinate impressions of the desired portions of the subordinate impressions; replacing the cutouts of the major impression by those of the subordinate impressions and then permanently securing the retained impressions to the film; and similarly preparing the remaining printing films of the color series by registering with the same subject copy.

10. The herein described process of preparing a composed printing film which includes: securing on a support having registering means, a key subject to be reproduced; attaching a film to a film holder having cooperable corresponding register means; assembling said holder with said support in register therewith and with the film over the key subject; applying to said film a major impression of the key subject, the impression being directly superposed over the key subject; applying to said impression a subordinate impression directly superposed over the corresponding portion of the key subject; and replacing a portion of said major impression by the corresponding desired portion of the subordinate impression.

11. The herein described process of preparing a color series of printing films which includes: mounting a key subject on a flat support with which is associated registering means; attaching a film to a holder having cooperable register means and assembling the holder with said support in registered position with respect thereto and with the film over the key subject; applying to said film directly superposed over the key subject, one color impression of the key subject; and similarly preparing the remaining films of the color series by use of said key subject.

12. The herein described process of preparing a color series of composed printing films which includes: pasting a key subject on a flat support having register means associated therewith; attaching a film to a holder having cooperable register means and then assembling said holder with the support with the film over the key subject; temporarily applying to said film directly superposed over the key subject, a color impression of the major portion of the key subject; temporarily securing over the major impression a like color subordinate impression and directly superposed over the corresponding portion of the key subject; cutting out of said major impression a portion corresponding to the desired subordinate impression and substituting the latter for the cutout of the major impression; securing the retained impressions to the film; and similarly preparing the remaining films of the color series by use of the same given subject.

13. The herein described process of preparing a printing film which includes: placing in predetermined position on a support, a key having differently characterized areas to be reproduced; superimposing a film over and in contact with said key while the film is attached to a removable holder retained in predetermined position and location with respect to the key; applying to the upper side of the film effect-producing media corresponding to and directly superposed over the respective differently characterized areas of the key, whereby said holder and attached film may be used in a printing machine.

14. The herein described process of preparing a color series of printing films which includes: securing, on a flat support, having register means associated therewith, a key having differently characterized areas; attaching a film to a separate holder having cooperable register means and then assembling said holder with the support with the film over and in contact with the key; applying to the upper side of the film one color effect-producing media corresponding to and directly superposed over the respective differently characterized areas of the key; and similarly preparing the remaining films of the color series from the same key.

15. The herein described process of preparing a composed printing element which includes: securing on a support having reg-

istering means, a key subject to be reproduced by printing; attaching to a printing-element holder having cooperable corresponding registering means, a transparent printing element; assembling said holder with its printing element attached thereto, with said support in register therewith and with the transparent printing element superimposed over the key subject; and applying to the upper surface of the transparent printing element impressions corresponding to different portions of the key subject, each said portion being applied to the printing-element surface in position and location registered directly over the corresponding portions of the key subject.

In witness that I claim the foregoing I have hereunto subscribed my name this 30th day of September, 1930.

WILLIAM C. HUEBNER.