

Jan. 19, 1954

H. C. YUTZY ET AL
PHOTOGRAPHIC COPYING APPARATUS

2,666,384

Filed Dec. 21, 1951

3 Sheets-Sheet 1

Fig. 1

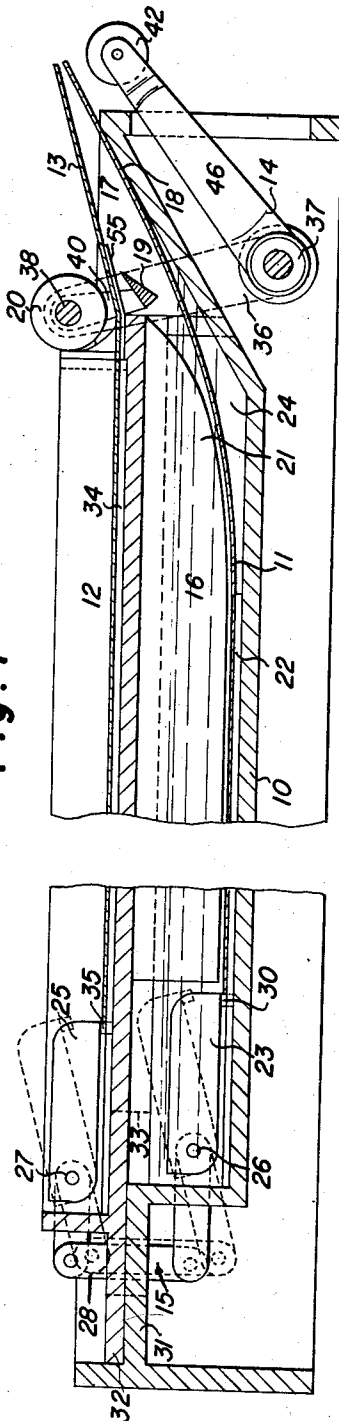


Fig. 2

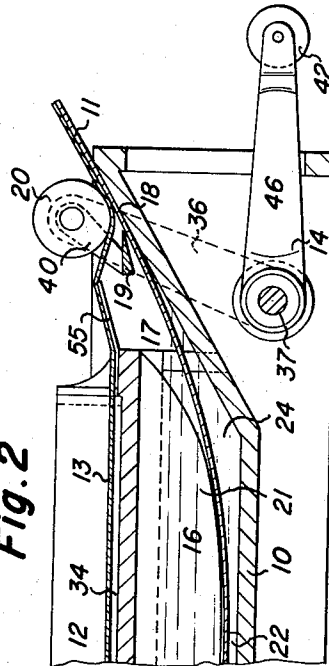
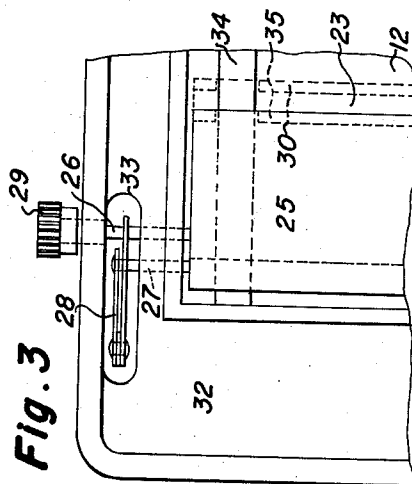


Fig. 3



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3 Sheets-Sheet 2

Fig. 7

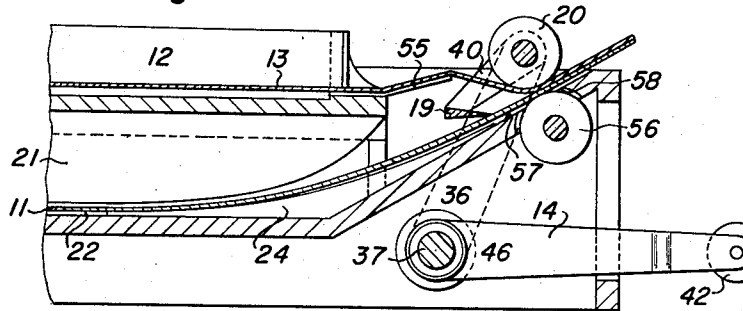


Fig. 5

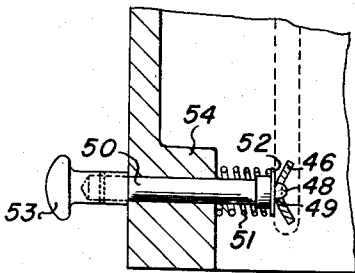


Fig. 4

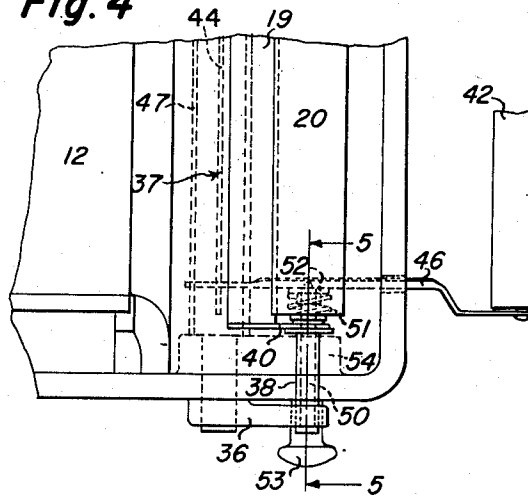
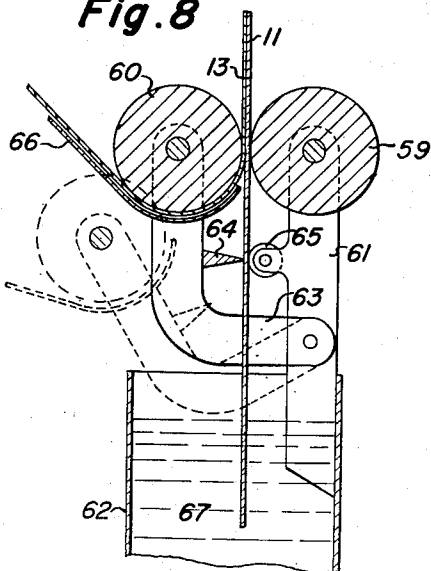


Fig. 8



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3 Sheets-Sheet 3

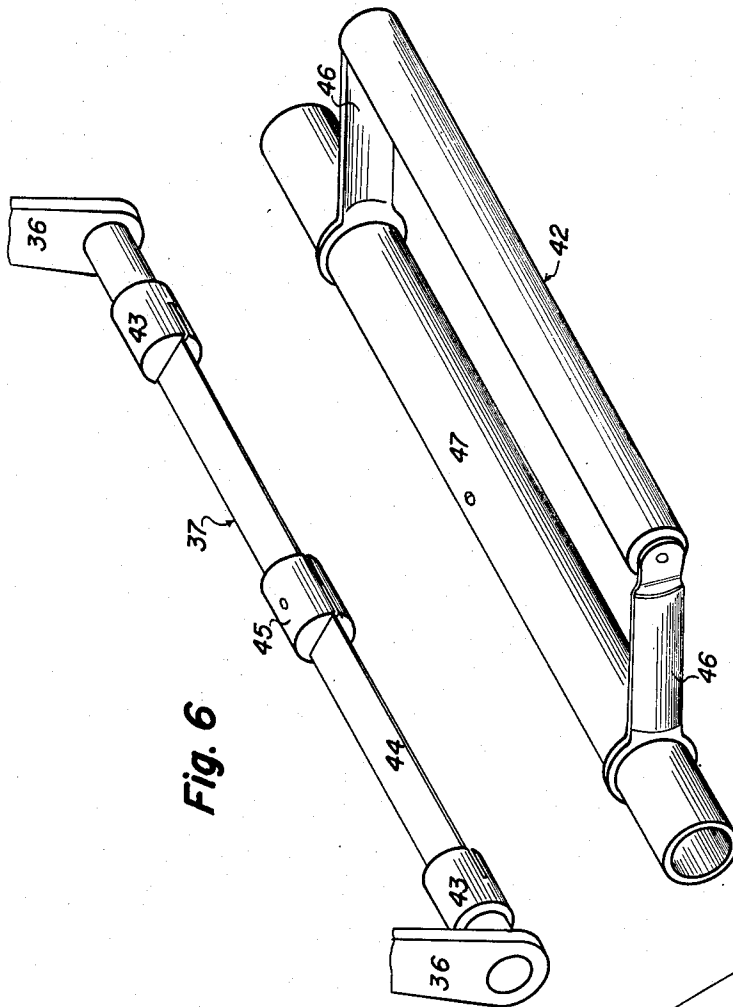


Fig. 6

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2,666,384

PHOTOGRAPHIC COPYING APPARATUS

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Application December 21, 1951, Serial No. 262,778

18 Claims. (Cl. 101—131)

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This invention relates to photographic reproduction and more particularly to a photographic copying apparatus. Specifically, it relates to a photographic processing and image-transfer device whereby an exposed sensitized photographic sheet may be processed in a suitable liquid and withdrawn in contact with a second sheet, which is non-sensitized, to cause transfer of an image from the first sheet to the second.

In United States Patent No. 2,596,756, granted May 13, 1952, Henry C. Yutzy and Edward C. Yackel describe a process wherein a film or paper support, coated with a substantially unhardened silver halide gelatin emulsion containing a pigment or dye and a tanning developing agent, is exposed to a suitable two-tone subject, such as a line or half-tone subject, after which the sensitized film or paper is processed by immersion in an alkaline solution. This processing results in the developing of the exposed image and the simultaneous hardening or tanning of the gelatin in the exposed and developed areas. Thereafter, the excess fluid may be squeezed from the processed sheet which is then pressed, while still moist, into contact with a non-sensitized sheet of paper having an absorbent surface. After separation of the two sheets, it will be found that a stratum of the unexposed and, therefore, unhardened areas of emulsion layer will have been transferred to the sheet of paper. This process thus produces a direct-positive image. Moreover, although the image is immediately discernible upon separation of the two sheets because of the pigment or dye in the transferred emulsion, this image will darken further upon exposure to light since the transferred emulsion also contains sensitized silver halide.

This process is especially useful since it permits making several reproductions from the exposure of a single sensitized sheet. This is possible because in the transfer of unhardened gelatin to the absorbent sheet only a stratum thereof is carried over. The processed sheet may be again wetted in the alkaline solution, squeezed and pressed against a second absorbent sheet whereby a second stratum of the unhardened gelatin will be transferred. It is possible to repeat this a number of times before the unhardened gelatin is exhausted to the extent that no longer acceptable copies are obtainable.

Since the composition of the emulsion, as well as a number of modifications thereof, and the chemistry of this process are fully disclosed in

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the above-noted patent and actually form no part of the present invention, we have omitted such data in this specification. We refer to this process, however, in that the apparatus disclosed below, which comprises the present invention, is particularly adapted for use in this process and in such variations thereof as may occur to those skilled in this art.

The apparatus embodying the present invention includes a number of unique features which particularly adapt it to its intended use. These features, while of apparent simplicity, provide effective means for carrying out the several steps of the process for which the apparatus is intended. One such feature is the relative positioning of the processing tank and the supporting means for the absorbent, non-sensitized paper or image-receiving sheet whereby the latter is maintained above the liquid level, or out of contact with the body of processing solution, and yet is so positioned relative to the exposed sensitized sheet, which has been immersed in the processing solution, that, as both sheets are simultaneously withdrawn from the apparatus, a simple, manually-operable mechanism squeezes the excess solution from the processed sensitized sheet and immediately thereafter presses this processed sheet into intimate contact with the image-receiving sheet.

The latter mechanism, too, is a feature of the present invention since it not only accomplishes the above several steps of the process by means of a single manipulation thereof, but may also include such other valuable and novel elements as means for automatically controlling the pressure of the squeegee upon the processed sheet and means for automatically providing that uniform pressure is applied across the width of the two superposed sheets as these are withdrawn from the apparatus, thereby insuring more uniformity in the intensity of the transferred image. Still another feature of one form of the invention is the mechanical arrangement by which the apparatus is adapted to handle sheets of two different lengths.

It is, therefore, an object of the present invention to provide a new and improved photographic copying apparatus.

It is a further object of this invention to provide a new and improved processing and image-transfer apparatus which is adapted for the production of a plurality of copies from the exposure of a single sensitized sheet.

It is a still further object of this invention to provide an apparatus of the character described which includes manually-operable means, the operation of which both squeezes the excess liquid from the processed sensitized sheet and presses this sheet into contact with the image-receiving sheet as the two sheets are withdrawn from the apparatus.

It is a still further object of this invention to provide an apparatus of the character described in which the pressure of the squeegee upon the processed sheet is automatically controlled.

It is a still further object of this invention to provide an apparatus of the character described which is adapted to automatically maintain a uniform pressure across the width of the two superposed sheets as these are withdrawn from the apparatus.

It is a still further object to provide an apparatus of the character described which is readily adapted to handle sheets of two different sizes.

Other objects and advantages of the invention will become apparent from the following description taken in connection with the accompanying drawings, and it will be understood that many changes may be made in the details of construction and arrangement of parts shown and described without departing from the spirit of the invention as expressed in the accompanying claims. We, therefore, do not wish to be limited to the exact details shown and described as the preferred forms only have been shown by way of illustration.

In the drawings:

Fig. 1 is a vertical sectional view, taken along the length of a processing and image-transfer apparatus which embodies the present invention;

Fig. 2 is a similar sectional view of one end of the same apparatus in which the pair of arms which mount the pressure roller and squeegee mechanism have been rotated into an operative position;

Fig. 3 is a plan view of a portion of the same apparatus, illustrating certain details of the rotatable sheet stop mechanism;

Fig. 4 is a plan view of another portion of the apparatus, illustrating the details of the releasable means for locking the pressure roller and squeegee in operative position;

Fig. 5 is a sectional view, taken on the line 5-5 of Fig. 4, showing this same releasable locking means;

Fig. 6 is an exploded view of the handle means for rotating the pair of arms which mount the pressure roller and the squeegee mechanism;

Fig. 7 is a vertical sectional view of one end of an apparatus, illustrating a modification of the means for pressing the two sheets into intimate contact; and

Fig. 8 is a vertical sectional view of still another modified form of the invention.

The preferred form of the present invention, shown in Figs. 1 to 6, comprises the tank 10 in which the exposed sensitized sheet 11 is processed, the supporting tray 12 for the non-sensitized or image-receiving sheet 13, and the mechanism 14, the manual operation of which functions to squeeze the excess liquid from the processed sheet and to immediately thereafter press this sheet into intimate contact with the non-sensitized sheet, as the two sheets are withdrawn from the apparatus. In addition, the preferred form includes a rotatable sheet stop mechanism

15, the function and operation of which will be later described.

The tank 10 is provided with a horizontal flange 31 extending about three sides thereof. The supporting tray 12 has a similar flange 32. This form of construction permits the tray 12 to be nested upon and readily secured to the tank 10, whereby the former in effect provides a closure or cover for the greater length of the tank, as will be apparent from Fig. 1. The tank itself is adapted to contain the processing liquid 16 into which the exposed sensitized sheet 11 is inserted through an opening 17 above the liquid level at one end of the tank. The tank, too, is provided with a sloping surface 18, which not only facilitates the insertion of the sheet 11 into the tank, but cooperates with the squeegee 19 and pressure roller 20, as will be hereinafter described. Fin-like projections 21 depend from the bottom of the tray 12, extending lengthwise of the tank, to serve as guides for insuring that the sheet is immersed in the body of the processing liquid. Several ribs 22, projecting upwardly from the bottom of tank 12 and also extending lengthwise thereof, are staggered laterally with respect to the fin-like projections 21. They cooperate with the rotatable sheet stop 23 for a purpose which will become later apparent. The ribs 22 terminate short of the sloping surface 18 at the end of the tank and concave fins 24 constitute continuations of the ribs and together therewith and with the fin-like projections 21 comprise guide means for facilitating the insertion of the exposed sensitized sheet into the tank and below the liquid level.

It will be obvious that the length of copy which may be produced is determined by the length of the tank 10 and the supporting tray 12, the sheets being normally inserted until the forward edges thereof abut against the end wall of the tank and of the supporting tray. There are occasions, however, when a sheet of shorter length would be adequate. For this purpose, there is provided the rotatable sheet stop mechanism 15, which is illustrated in Figs. 1 and 3. This mechanism includes the rotatable stops 23 and 25, the first of which is mounted in the tank, the second in the sheet supporting tray. The stops are fixed to shafts 26 and 27 which are journaled, respectively, in the sides of the tank and the supporting tray. In order that the stops may be operated in unison, the shafts are interconnected through the linkage 28 which extends through the aligned apertures 33 in the flanges 31 and 32. A hand knob 29, connected to an extension of the shaft 26, permits the operator to rotate simultaneously the two stops 23 and 25 into either of the two positions shown in Fig. 1. When the stops occupy the position shown in dashed lines, they are ineffective as stops and the sheets may be inserted into the apparatus until the ends thereof abut the end walls of the tank and supporting tray. However, upon the stops being rotated into the full-line position of Fig. 1, they are interposed in the path of the sheets and limit the length of sheet which may be inserted to something less than when they are rotated into the former position. Thus, with a single adjustment the apparatus is adapted to handle sheets of either of two predetermined lengths, which will be an obvious advantage where the apparatus is intended for the reproduction of copy of different sizes. To insure that the exposed sensitized sheet does not ride under the stop 23

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in tank 10 when this stop is rotated into the full-line position of Fig. 1, the edge of the stop is provided with a downwardly projecting shoulder 30 which is cut away at intervals conforming to the spacing of the ribs 22 in the bottom of the tank, so that such cut-away sections register with said ribs. The sections of the shoulder 30 projecting between the ribs preclude any possibility of the sheet 11 passing under the stop 23 when this is rotated into the sheet-engaging position.

The supporting tray 12 for the non-sensitized sheet 13 is provided with similar longitudinal ribs 34 on the bottom thereof and the rotatable stop 25 has a shoulder 35 which is cut away at intervals to cooperate with the ribs to prevent the sheet 13 from passing under the stop when this is rotated into sheet-engaging position. The rib and shoulder construction in the tray 12 is essentially identical with that in the tank.

The mechanism 14 includes a pair of arms 36 which are fixed to the ends of element 37, adjacent portions of the element being journaled into the sides of the apparatus. An arbor 38, the ends of which are journaled into the free ends of said pair of arms, has fixed thereto the pressure roller 20. A second pair of arms 40, somewhat shorter than the first pair, has its ends rotatably mounted upon the ends of arbor 38 with a friction fit thereon. Between the other ends of said pair of arms 40 is mounted a squeegee 19, which is preferably a rubber blade of the type used in windshield wipers. Rotation of the arms 36 from the inoperative position illustrated in Fig. 1 to the operative position of Fig. 2 carries the roller 20 and squeegee 19 into engagement with the sloping surface 18. Handle means 42 are provided so that the arms 36 may be manually rotated. A feature of this invention is the construction of this handle means and the manner of connecting the same to the arms 36, whereby a uniform pressure of the pressure roller transversely of the sheets of paper being operated upon is assured. The element 37, upon which the ends of the pair of arms 36 are fixed and which is itself journaled into the sides of the apparatus, includes the spindles 43, reduced extensions of which are journaled into the sides of the apparatus and serve further to mount the arms 36 (note Fig. 6). A torsion spring 44 connects the spindles 43 by having its ends secured in slots in the spindles. At the midpoint of the torsion spring 44 there is secured a cylindrical plug 45. The handle means 42 includes a pair of arms 46 which are fixed to the tube 47 and, when assembled, this tube encloses the element 37 to which it is secured by pinning it to the cylindrical plug 45, about which it snugly fits. On the other hand, the ends of the tube provide internal bearing surfaces which are freely rotatable upon the spindles 43.

In operation, depressing the handle means 42 rotates the complete mechanism 14 until the pressure roller 20 engages the sloping surface 18. Beyond this point, continued depressing motion of the handle will cease to move the roller further but does increase the pressure between the roller and sloping surface by applying a torque upon the spring 44, which force is transmitted individually through the arms 36 to the roller. Since the arms 36 are independently pivoted, except for the constraint offered by spring 44, it follows that the arms can rotate a few degrees with respect to each other to compensate for any lack of alignment or parallelism that may

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exist between the roller and the sloping surface. This arrangement thus assures that the roller will automatically provide a substantially uniform pressure across the width of the sheets as they are withdrawn from the apparatus in spite of any small lack of parallelism that may exist between the roller and the inclined or sloping surface.

The handle means 42 are held in the depressed position by a detent 48 which engages an aperture 49 in one of the handle arms 46, as may be seen in Figs. 4 and 5. The detent 48 which is formed at the end of the pin 50 is normally urged into engagement with the aperture, when the arm is thus depressed, by the action of the coil spring 51 which is wound about the pin 50 and which is compressed between the collar 52 and an apertured boss 54 which is formed on an inner surface of the tank member and through which the pin passes. To release the handle it is only necessary to grasp the pin by the knob 53 and to withdraw it against the action of the coil spring, whereby the latter is further compressed and the detent withdrawn from the handle arm. It is not necessary for the operator to grasp the pin 50 to engage the detent in the arm aperture because this arm 46 is curved in cross-section, as clearly seen in Fig. 5, and thus functions as a cam surface for the detent to ride over until it falls into the aperture 49. Instead of the described spring-pressed detent other mechanical arrangements will suggest themselves to those skilled in the art and the use of such obvious substitutions is contemplated to be within the scope of the present invention. As a matter of fact, no particular locking means need be employed at all to hold the roller in engagement with the inclined or sloping surface; the operator can readily hold the handle in its depressed position with one hand while he withdraws the superposed sheets from the apparatus with the other hand.

The mechanism 14 is normally held in the inoperative position, shown in Fig. 1, by a simple spring (not shown). For example, a spring, wound about one end of tube 47, may have one end thereof bearing against arm 46 and the other end against an inside surface of the tank to urge the whole rotatable assembly in a counterclockwise direction into the inoperative position of Fig. 1. The sensitized sheet, having been suitably exposed to copy of a two-tone nature by the reflex method, is inserted, emulsion side up, through the opening 17 into tank 10. A non-sensitized sheet is threaded between the pressure roller 20 and squeegee 19 into the supporting tray 12 and to further facilitate this step the tray is provided with a projecting apron 55 which extends from the bottom of the supporting tray between the roller and squeegee to a position beyond the roller. Both sheets, which have been inserted as far as they will go, i. e. until they have contacted either the end walls of the tray and tank or the stops 25 and 23, if these have been rotated into sheet-engaging position, will have the ends thereof protruding from the opening 17, as illustrated in Fig. 1. After sufficient time has elapsed for the processing of the exposed sheet, the handle means 42 are depressed to the position of Fig. 2 and the roller 20 will press the two sheets into intimate contact upon the sloping surface 18. As the operator grasps the ends of the sheets and begins to withdraw these from the apparatus, the roller 20 is caused

to rotate and the arbor 38 on which the roller is fixed will similarly rotate. Since the arms 40, which mount the squeegee 19 therebetween, are mounted upon the arbor by means of friction bearings, the rotation of the roller 20 in a counterclockwise direction (Fig. 2) will urge the arms 40 to rotate in this same direction, thus causing the squeegee to almost immediately thereafter make contact with the sheet 11. Moreover, the continued rotation of the roller will continue to maintain the squeegee in pressure contact with the processed sheet. Such an arrangement precludes the possibility of the squeegee being ineffective because of its not having been properly aligned with the roller 20 in respect to the inclined surface with which both roller and squeegee must simultaneously cooperate as the pair of sheets is withdrawn from the apparatus. Since the squeegee arms 40 are independently mounted upon arbor 38, except for the restraint of the squeegee itself to which the free ends thereof are connected, the arms 40 can rotate a few degrees with respect to each other, which will thus compensate for any small lack of parallelism existing between the squeegee and the inclined surface. After the two sheets have been withdrawn, they may be readily stripped apart with the resultant transfer of unhardened gelatin (and a positive image) from sheet 11 to sheet 13. Additional copies may be obtained by reinserting sheet 11 in the tank and again withdrawing it in pressure contact with additional sheets, one at a time.

Although in the preferred form of the invention the pressure roller and squeegee are described and illustrated as bearing upon a plane sloping surface, when in their operative position, it will be apparent that a curved surface may be substituted for the plane surface. If a curved surface is employed, the slope at each point of its operative surface should be inclined downwardly toward the tank itself to facilitate drainage of the liquid from sheet 11 back into the tank. Still another modification, which is considered to fall within the scope of this invention, is the provision of a second pressure roller 56 which is rotatably mounted below the sloping surface 57 but projects through an opening 58 therein to be engaged by roller 20 when this is rotated into operative position by the depressing of the handle means 42. In this modification, illustrated in Fig. 7, the pressure upon the superposed sheets is obtained solely by their passage between the rollers 20 and 56.

While in the preferred form of our invention the several sheets are processed and operated upon while these are in an essentially horizontal position, we also contemplate the application of the principles of our invention to a vertical tank, such as illustrated in Fig. 8. In this variation pressure is applied to the two sheets 11 and 13 by drawing these between pressure rollers 59 and 60. Roller 59 is rotatably secured to bracket 61 which is fixed to vertical tank 62. Roller 60 is rotatable on bracket 63 which is pivotally mounted upon bracket 61 to swing between operative and inoperative positions. In Fig. 8 the inoperative position of bracket 63 is indicated by dashed lines. Also upon brackets 63 and 61 are the elements 64 and 65 which cooperate to function as means for removing excess liquid from sheet 11 as this is withdrawn from the tank. Element 64 is preferably a squeegee of the rubber-blade type described in connection with the pre-

ferred form of our apparatus and is fixed to movable bracket 63, while element 65 comprises a relatively small roller, mounted upon bracket 61, which is adapted to be engaged by squeegee 64 when bracket 63 is swung into operative position. Also rigidly secured to bracket 63 is the guide or supporting means 66 which maintains the image-receiving sheet 13 clear of the body of processing liquid 67 and which guides this sheet into the bight between rollers 59 and 60. The operation of the apparatus of Fig. 8 is relatively simple. With bracket 63 swung into the inoperative position shown in dashed lines in Fig. 8, the exposed sensitized sheet 11 is inserted vertically into tank 62. The image-receiving sheet 13 is fed into the guide means 66 and bracket 63 rotated to its illustrated full-line position. The length of sheet 11 relative to the depth of tank 62 is such, and the length of sheet 13 passed over guide 66 is such, that the ends of the two sheets project above the pressure rollers 59 and 60 and provide means by which the superposed sheets may be grasped by the operator to draw these between the pressure rollers. Bracket 63 is preferably spring actuated to hold the rollers 59 and 60 in pressure contact. However, other mechanical arrangements may be utilized to bias the rollers either apart or together or into both of the two positions into which the operator may selectively swing the rotatable bracket 63. On the other hand, no biasing means at all may be employed and pressure between the rollers may be obtained from the force exerted by the hand of the operator. For the latter purpose and for ease of manipulation, the rotatable bracket 63 may be provided with some kind of handle, many forms of which will suggest themselves to those skilled in the art. It will be obvious that as the two sheets are withdrawn after the sensitized sheet 11 has been suitably processed in tank 62, squeegee 64 and roller 65 cooperate to remove excess fluid from the processed sheet just prior to its being engaged by the image-receiving sheet 13 as the two sheets are rolled together under pressure. After withdrawal from the apparatus, the two sheets may be readily stripped apart with the result that a stratum of the unhardened gelatin has been transferred from the sensitized to the image-receiving sheet.

Although we have not described the use of any temperature control means for use with the disclosed processing tanks, it will be apparent that any conventional heating element, thermostat, heat exchange means, etc. may be utilized in the described apparatus according to the requirements of the process. And while we have disclosed apparatus especially adapted for use in a particular photographic process, it should be understood that its use is not necessarily limited thereto.

From the foregoing description, it will be apparent that we have provided means for obtaining all the objects and advantages of this invention.

What we claim and desire to secure by Letters Patent of the United States is:

1. A processing and image-transfer apparatus comprising a processing fluid container having an opening through which an exposed sensitized sheet may be inserted and withdrawn, means adapted to support an image-receiving sheet externally of the body of processing fluid, an arm

pivotally connected to the apparatus and adapted to be rotated between operative and inoperative positions, a pressure device secured to the arm, and means on the container adjacent to said opening cooperating with said pressure device when the arm is rotated into operative position to exert pressure upon the sensitized sheet and image-receiving sheet as the sheets are withdrawn from the apparatus in superposed relation between the pressure device and said cooperating means.

2. A processing and image-transfer apparatus comprising a processing fluid container having an opening through which an exposed sensitized sheet may be inserted with the end thereof projecting from the opening, means adapted to support an image-receiving sheet externally of the body of processing fluid and to position the end thereof in overlapping relation with the end of said sensitized sheet at said opening, an arm pivotally connected to the container and adapted to be selectively rotated into operative and inoperative positions, a pressure device on said arm, and means on the container adjacent to said opening cooperating with said pressure device when the arm is rotated into operative position to press said two sheets together as they are withdrawn from the apparatus between the pressure device and said cooperating means.

3. A processing and image-transfer device comprising a processing fluid container having an entrance through which an exposed sensitized sheet may be inserted and withdrawn, an arm pivotally connected to the container and adapted to be rotated between operative and inoperative positions, pressure means and a squeegee mechanism on said arm, means on the container adjacent to said entrance adapted to be contacted by said pressure means and squeegee when said arm is rotated into operative position and to be spaced therefrom when the arm is rotated into inoperative position, and means adapted to support an image-receiving sheet externally of the body of processing fluid with the end of the latter sheet positioned between the pressure means and squeegee on said arm.

4. A processing and image-transfer apparatus comprising a processing fluid container having an opening through which an exposed sensitized sheet may be inserted with the end thereof projecting from the opening, an arm pivotally connected to the apparatus and adapted to be rotated into operative and inoperative positions, a pressure device and a squeegee on said arm, means adapted to support an image-receiving sheet externally of the body of processing fluid with an end thereof projecting between the pressure device and squeegee when the arm is in its inoperative position, and means on the container adjacent to said opening cooperating with said pressure device and squeegee when the arm is rotated into operative position whereby the squeegee and said cooperating means remove excess fluid from the processed sensitized sheet and the pressure device and cooperating means thereafter press the two sheets together as they are withdrawn from the apparatus.

5. A processing and image-transfer apparatus comprising a tank adapted to contain a processing fluid, an opening in said tank through which an exposed sensitized sheet may be inserted with the end thereof projecting through the opening, an arm pivotally connected to the apparatus and adapted to be rotated between operative and inoperative positions, a pressure roller and means

including a squeegee on said arm, means for supporting an image-receiving sheet above the tank with an end of the latter sheet projecting between the pressure roller and squeegee when said arm is in inoperative position, said tank having an inclined surface adjacent to said opening therein which is adapted to cooperate with both the squeegee and pressure roller when the arm is in operative position whereby excess fluid is removed from the processed sensitized sheet by its passage between the squeegee and said inclined surface and both sheets are thereafter brought into pressure contact by their passage between the pressure roller and the inclined surface as the sheets are simultaneously withdrawn from the apparatus.

6. A processing and image-transfer apparatus comprising a tank for containing a processing fluid, said tank having an opening and an inclined surface adjacent to said opening, an arm pivotally connected to the apparatus and adapted to be rotated into operative and inoperative positions, a pressure roller and means including a squeegee on said arm, said pressure roller and squeegee being adapted to make contact with the inclined surface of the tank when said arm is rotated into operative position and to be spaced from said inclined surface when said arm is rotated into inoperative position.

7. A processing and image-transfer apparatus comprising a tank for containing a processing liquid, said tank having a sloping surface and an opening at one end thereof through which an exposed sensitized sheet may be inserted into the tank, a pair of arms pivotally connected to the apparatus and adapted to be rotated between operative and inoperative positions, a pressure roller and means including a squeegee secured to and positioned between said arms, means for supporting an image-receiving sheet above the tank with the end of the sheet extending between the pressure roller and squeegee when said pair of arms is in inoperative position, said pressure roller and squeegee being adapted to be pressed against said sloping surface by rotation of the pair of arms into operative position, whereby excess liquid is removed from the processed sensitized sheet by its passage between the squeegee and the sloping surface and both sheets are thereafter brought into pressure contact by their passage between the pressure roller and the sloping surface as both sheets are simultaneously withdrawn from the apparatus.

8. A processing and image-transfer apparatus comprising a tank for containing a processing liquid, said tank having a sloping surface and an opening above the liquid level at one end thereof, a pair of arms pivotally connected to the apparatus and adapted to be rotated into operative and inoperative positions, a pressure roller and means including a squeegee secured to and positioned between said arms, said pressure roller and squeegee being adapted to engage the sloping surface of the tank when said pair of arms is rotated into operative position and to be spaced from said sloping surface when the pair of arms is rotated into inoperative position, handle means for rotating said pair of arms, and a resilient connection between each of said arms and the handle means.

9. A processing and image-transfer apparatus comprising a tank for containing a processing liquid, said tank having a sloping surface and an opening above the liquid level at one end thereof through which an exposed sensitized sheet may be inserted into the tank, a pair of

arms pivotally connected to the apparatus and adapted to be rotated into operative and inoperative positions, a pressure roller and means including a squeegee secured to and positioned between said arms, means for supporting an image-receiving sheet above the tank with the end of the sheet extending between the pressure roller and squeegee when said pair of arms is in inoperative position, said pressure roller and squeegee being adapted to be pressed against said sloping surface by rotation of the pair of arms into operative position whereby the processed sensitized sheet is squeegeed and the two sheets are thereafter brought into pressure contact as both sheets are simultaneously withdrawn from the apparatus, handle means for rotating said pair of arms, and a spring connection between each of said arms and said handle means for compensating for any lack of parallelism between the pressure roller and the sloping surface.

10. A processing and image-transfer device comprising a tank for containing a processing liquid, said tank having an opening above the liquid level through which an exposed sensitized sheet may be inserted, a pair of arms pivotally connected to the device and adapted to be rotated into operative and inoperative positions, a pressure roller and a squeegee secured to and positioned between said arms, means for supporting an image-receiving sheet above the liquid level with an end of the latter sheet extending between the pressure roller and squeegee when said pair of arms is in inoperative position, and means associated with said tank adapted to be engaged above the liquid level by said pressure roller and squeegee when said pair of arms is rotated into operative position and to be spaced from said pressure roller and squeegee when the pair of arms is rotated into inoperative position.

11. A device according to claim 10 further including handle means for rotating said pair of arms, and a resilient connection between each of said arms and the handle means.

12. A processing and image-transfer device comprising a tank for containing a processing liquid, said tank having an opening above the liquid level through which an exposed sensitized sheet may be inserted, a first pair of arms pivotally connected to the device and adapted to be rotated into operative and inoperative positions, an arbor, the ends of which are journaled in said arms, a pressure roller fixed to said arbor, a second pair of arms, the ends of which are rotatably mounted upon said arbor with a friction fit, a squeegee secured to and positioned between the second pair of arms, means for supporting an image-receiving sheet above the liquid level with an end of the latter sheet extending between the pressure roller and the squeegee, and means on the tank adjacent to said opening adapted to be engaged above the liquid level by said pressure roller when the first pair of arms is rotated into operative position, said latter means being adapted to be also engaged by the squeegee upon rotation of the pressure roller and the resulting rotation of said second pair of arms.

13. A device according to claim 12 further including handle means for rotating said first pair of arms, and a torsion spring connection between each of said latter arms and the handle means.

14. A processing and image-transfer apparatus comprising a tank for containing a processing liquid, said tank having a sloping surface and

an opening above the liquid level at one end thereof, a first pair of arms pivotally connected to the apparatus and adapted to be rotated into operative and inoperative positions, an arbor, the ends of which are journaled in said arms, a pressure roller fixed to said arbor, a second pair of arms, the ends of which are rotatably mounted upon said arbor with a friction fit, and a squeegee secured to and positioned between the second pair of arms, said pressure roller being adapted to engage the sloping surface of the tank above the liquid level when the first pair of arms is rotated into operative position, and said squeegee being adapted to also engage said sloping surface above the liquid level when the pressure roller is caused to be rotated.

15. An apparatus according to claim 14 further including handle means for rotating said first pair of arms, and a resilient connection between each of said latter arms and the handle means.

16. A processing and image-transfer apparatus comprising a tank for containing a processing liquid, said tank having an opening above the liquid level through which an exposed sensitized sheet may be inserted and withdrawn, an arm pivotally connected to the apparatus and adapted to be rotated between operative and inoperative positions, pressure means and a squeegee on said arm, means on the tank adjacent to said opening adapted to be contacted by said pressure means and squeegee when said arm is rotated into operative position and to be spaced therefrom when the arm is rotated into inoperative position, means for supporting an image-receiving sheet above the liquid level with an end of the latter sheet extending between the pressure means and the squeegee, means for engaging the end of both of said sheets to restrict the length of each sheet insertable in the apparatus, and mechanically interconnected means adapted to simultaneously vary the length of both sheets insertable in said apparatus a substantially equal amount.

17. An apparatus according to claim 16 in which said mechanically interconnected means comprises a pair of rotatable stops, one of which is adapted to engage the sensitized sheet end in said tank, the other of which is adapted to engage the end of the image-receiving sheet on said supporting means therefor, and a linkage therebetween for simultaneously rotating both stops into or out of said sheet-engaging position.

18. A processing and image-transfer apparatus comprising a tank for containing a processing liquid, said tank having a sloping surface and an opening above the liquid level at one end thereof through which an exposed sensitized sheet may be inserted, a pair of arms pivotally connected to the apparatus and adapted to be rotated between operative and inoperative positions, a pressure roller and squeegee secured to and positioned between said arms, means for supporting an image-receiving sheet above the liquid level with an end of the latter sheet extending between the pressure roller and the squeegee, said pressure roller and squeegee being adapted to engage the sloping surface of the tank when said pair of arms is rotated into operative position and to be spaced from said sloping surface when the pair of arms is rotated into inoperative position, handle means for rotating said pair of arms, a pair of rotatable stops, one of which is adapted to engage the sensitized sheet end in said tank to restrict the length of sheet which may be in-

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serted therein, the other of which is adapted to engage the end of the image-receiving sheet on said supporting means to similarly restrict the length of sheet supported thereon, and mechanically interconnected means for simultaneously rotating both stops into or out of said sheet-engaging position.

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Number
416,628
701,447
2,477,304
5 2,582,001

Number
879,995
10 269,199

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
198,980	Hine	Jan. 8, 1878 15

14

Name	Date
Jewell	Dec. 3, 1889
Yawman	June 3, 1902
Land	July 26, 1949
Bornemann	Jan. 8, 1952

FOREIGN PATENTS

Country	Date
France	Dec. 10, 1942
Switzerland	Oct. 2, 1950