Dec. 23, 1958 F. W. RUIJS 2,865,275

TRANSFER DEVELOPING APPARATUS

Filed March 3, 1955

Fig. 1

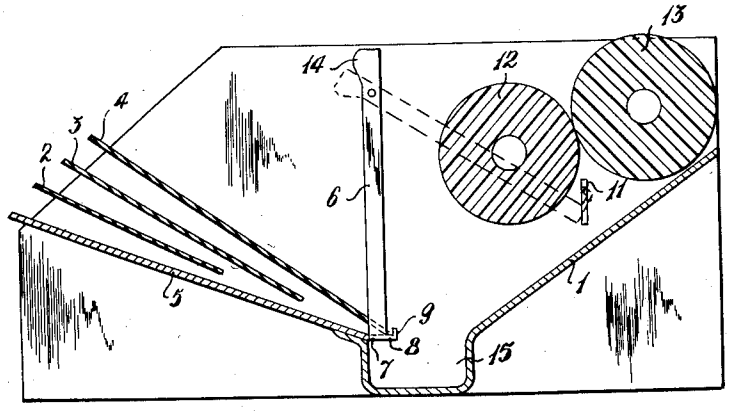


Fig. 2

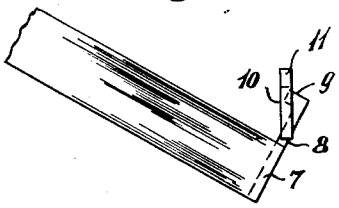
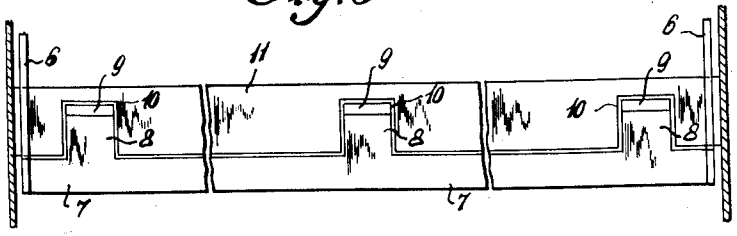


Fig. 3



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TRANSFER DEVELOPING APPARATUS

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6 Claims. (Cl. 95—89)

This invention relates to a method for developing light-sensitive papers or similar coated carriers, or for the use of the contact transfer process, in which the coated carrier is guided through a developing path, and to a device for carrying out this method.

In these known devices each coated carrier to be treated is introduced by hand into the developing bath until its front edge comes into contact with co-acting rollers. For this purpose, it is necessary that guiding faces are provided having such a curved shape that the coated carriers are guided through the developing bath up to the rollers. This known device has the disadvantage that in moving along the curved guiding faces the coated carriers met with considerable resistance so that they may get stuck. Moreover, the precipitate being produced in the developing bath will be scooped up by the coated carriers so that it gets on and between the coated carriers which unfavourably affects the quality of the coated carriers treated. Due to the resistance experienced by the coated carriers on the curved guiding faces there is the risk that they will shift in relation to each other, so that for example the negative will not entirely transfer onto the positive.

The method according to this invention removes these disadvantages in that, when the coated carrier is introduced into the developing liquid, its front edge pushes a supporting means so far upwards until the coated carrier may be caught by the co-acting rollers or like pressing device. During this movement, the supporting means may be at any desired distance above the bottom of the container for the developing bath. As only the front edges of the coated carriers are supported by the supporting means, the said coated carriers move freely through the liquid so that, when they lie one above the other, they do not meet with resistance and are only pressed against one another in the pressing device. As the coated carriers do not come into contact with the bottom the latter may be constructed in an arbitrary way.

A preferred embodiment of the method, according to the invention, is characterized in that the lowermost coated carrier is introduced with a start into the developing liquid. In this way one is sure that all coated carriers are taken along by the supporting means and delivered to the pressing device.

The device for carrying out the method according to the invention, comprises a container containing the developing liquid, and is provided with one or more inlet openings for introducing the coated carrier(s) into the container, as well as a pressing device for pressing the coated carriers against one another and/or for squeezing the developing liquid out of the or each coated carrier. This device comprises at least one supporting means movable with the aid of the coated carrier itself, the said supporting means being arranged and constructed in such a manner that the front edge of the coated carrier is supported by said supporting means and is delivered to the co-acting rollers or like device, as well as

at least one device which causes the front edges of the coated carrier supported by the supporting means to leave this supporting means. The supporting means consists of a pivotally arranged arm on which a supporting face and an abutment for the front edge of the coated carrier are provided. The abutment may be formed by a supporting portion with an upright rim secured to the arm.

In a preferred embodiment of the device, the supporting means consists of two interconnected arms pivotally arranged close to the side walls of the apparatus, the connecting part of these arms having one or more abutments for the front edge of the coated carrier.

The releasing means for the abutment may, according to the present invention, consists of a member arranged at a fixed place in the apparatus, said member pushing the coated carrier free from the supporting means. This may be achieved in a simple way in that this releasing means is provided with recesses having such a width that the abutments may pass through the said recesses. When the supporting means is moved upwards, the abutments pass through these recesses so that the coated carrier is pushed free from the supporting means. The supporting means is then no longer driven by the coated carriers and can resume its initial position.

It is obvious that, although supporting means on which the front edges of the coated carrier loosely rest, are particularly preferable and simple, numerous different operating abutments and releasing means may be used. For instance, according to the present invention, the abutment may be pivotally arranged in relation to the supporting means or may be pivoted by the releasing means in such a manner that the coated carrier may move along the abutment.

In order to ensure that the front edges of the coated carriers will come on the supporting means it is possible, according to the present invention, to provide at the inlet side of the container at least two inlet guides which are so shaped that, when the lower end of the supporting means is in its initial position, this lower end is situated, at least partly, against or under the terminal edge of the lowermost inlet guide and the abutment of the said supporting means is situated, at least partly, against or in front of the terminal edge of the uppermost inlet guide. Consequently the space between the inlet guides is almost closed so that the precipitate is prevented as much as possible from getting between the inlet guides.

According to the present invention the supporting means is made as light as possible so as to require a minimum force for being moved. To this end, the supporting means may be made of a light material, such as artificial resin. When the supporting means has a large weight, it is preferred to balance it approximately. In that case, however, care should be taken that the supporting means may automatically pivot back into its initial position. Naturally, springs or other means may also be used for this purpose.

The invention will be described below with reference to the drawings showing diagrammatically, by way of example, an embodiment of the device according to the present invention.

Fig. 1 shows a cross section of this device.

Fig. 2 shows, on an enlarged scale, the position of the supporting means when the coated carrier or carriers have been pushed free from supporting means.

Fig 3 is a front view of part of Fig 2.

The device shown in the drawings comprises a container 1 for the developing bath. At the inlet side of this container there are three inlet guides 2, 3 and 4 for introducing the coated carriers into the developing bath. Portion 5 of the container bottom is also shaped as an

inlet guide. Fig. 1 shows that the inlet guides 4 and 5 are longer than the inlet guides 2 and 3 arranged therein between. The result is that when two or more coated carriers are inserted these are already lying one against the other before they reach the end of the inlet guides 4 and 5.

In the container 1 a supporting and carrying means is provided consisting of two arms 6 pivotally mounted in or on the inner walls of the container 1 or of the apparatus itself, said arms being interconnected by a connecting strip 7. This connecting strip 7 has projections 8 on which an abutment 9 is provided. The supporting means 6, 7 is so formed and arranged that the front of the connecting strip 7 rests against the terminal edge of the inlet guide 5 and that the terminal edge of the inlet guide 4 rests against the abutment 9. In this way it is ensured that the coated carriers inserted into the container 1 abut with their front edges against the abutments 9 in the corner between these abutments and the projections 8. When the coated carriers introduced in this way into the container 1 are moved farther they take along the supporting means 6, 7, the front edges of the coated carriers resting all the while on the supporting means.

When the supporting means 6, 7 approaches the position drawn in broken lines, the abutments 9 pass through recesses 10 of a releasing means 11 rigidly fixed in the container 1. Consequently the coated carriers are lifted from the projections 8 and from the connecting strip 7 of the supporting means 6, 7 and they are guided along the releasing means towards two coacting rollers 12, 13 by which they are caught and thereafter pressed together.

If desired, the supporting means 6, 7 may be provided with a counterweight 14 so that the force required for moving this supporting means is as small as possible. The bottom of the container 1 is so constructed that it has a deepened portion for receiving the precipitate. This deepened portion may also be provided in another place, for example below the rollers 12, 13.

It is obvious that the invention is not restricted to the embodiment described above and shown in the drawings, but that it is possible to make numerous modifications in the construction without departing from the scope of the invention. Only, it is essential that the supporting means is constructed as a carrying means driven by the coated carriers.

Instead of a releasing means pivotally mounted by means of arms, this releasing means may also be so constructed that the coated carriers follow a substantially straight path to the rollers 12 and 13. For this purpose guide means known per se, such as rod systems, may be used. In order to obtain an easy flow of liquid between the inlet guides these inlet guides 2 and 3 may have cutaway portions or like recesses.

I claim:

1. A photocopy developing device wherein light-sensitive coated carriers are advanced through a fluid developing bath comprising (*a*) a housing having an inlet at one end and an outlet at another end with a portion between the inlet and outlet at a lower level for containing the developing fluid and defined by a bottom wall, (*b*) means in communication with the inlet for guiding the coated carriers from the inlet into the developing fluid, (*c*) squeeze means spaced from the inlet with the developing fluid at a lower level inbetween for squeezing the coated carriers against one another after being separately wet with the developing fluid, (*d*) a support means pivotally mounted for swinging movement in the housing from a normal position adjacent to and in alignment with the outlet from the guide means to a displaced position adjacent the squeeze means for supporting the leading edges of the coated carriers in spaced relation with the bottom wall of the housing during movement from the guide means to the squeeze means, and (*e*) a stripping means stationarily positioned within the housing immediately in advance of the inlet to the squeeze means and in the operated position of said support means to engage the leading edges of said coated carriers for displacement from said supporting means into engagement with the squeeze means responsive to movement of the supporting means to operated position.

2. A photocopy developing device wherein light-sensitive coated carriers are advanced through a fluid developing bath comprising (*a*) a housing having an inlet at one end and an outlet spaced therefrom at another end portion with a bottom wall at a lower level therebetween for containing a developing fluid, (*b*) means in communication with the inlet for guiding the coated carriers in separated relation from the inlet to an outlet submerged in the developing fluid, (*c*) squeeze rolls mounted for rotational movement adjacent the outlet to the housing for pressing the coated carriers against one another subsequently to be separately wet by the developing fluid and prior to advancement of the coated carriers from the housing through the outlet opening, (*d*) a support means pivotally mounted for swinging movement within the housing from a normal position adjacent to and in alignment with the outlet of the guide means to a displaced position adjacent to and in alignment with the nip of the squeeze rolls for supporting the leading edges of the coated carriers in spaced relation with the bottom wall of the housing during movement of the guide means to the squeeze means, whereby the leading edges of the coated carriers are maintained out of contact with the bottom wall of the housing, and (*e*) a stripping means stationarily positioned within the housing to extend crosswise of the squeeze rolls immediately in advance of the nip thereof to engage the leading edges of the coated carriers for displacement from the support into the nip of the rolls responsive to movement of the support means to operated position.

3. A photocopy device as claimed in claim 2 in which the guide means comprises preferably vertically spaced-apart plates extending angularly downwardly with one of the ends in communication with the inlet opening and the other of the ends immersed within the bath of the developing fluid.

4. A photocopy device as claimed in claim 2 in which the support means comprises a cradle mounted for rocking movement having a rigid horizontally disposed plate extending crosswise of the housing in spaced relationship with the bottom wall of the housing and arms extending perpendicularly from the ends thereof, and means pivotally mounting the arms at their ends to adjacent walls of the housing and having an abutment on the plate which, when in normal position, lies adjacent the inner end portions of the guide means in position to be engaged by the leading edges of the coated carriers upon emergence from said guide means to convey the leading edges of the coated carriers from said guide means towards said squeeze means and out of contact with the bottom wall of the housing.

5. A photocopy device as claimed in claim 4 in which the abutment comprises laterally spaced apart vertically extending flanges.

6. A photocopy device as claimed in claim 5 in which the stripping means comprises a rigid member extending crosswise of the housing in advance of the squeeze means having abutments corresponding with the space between the abutments in the support means whereby the abutments of the stripping means effect displacement of the leading edge of the coated carriers from the support means as the carrier is advanced between the stripping means.

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