Sept. 20, 1955 H. R. GULLIXSON ET AL 2,718,181

CONTACT PRINTER

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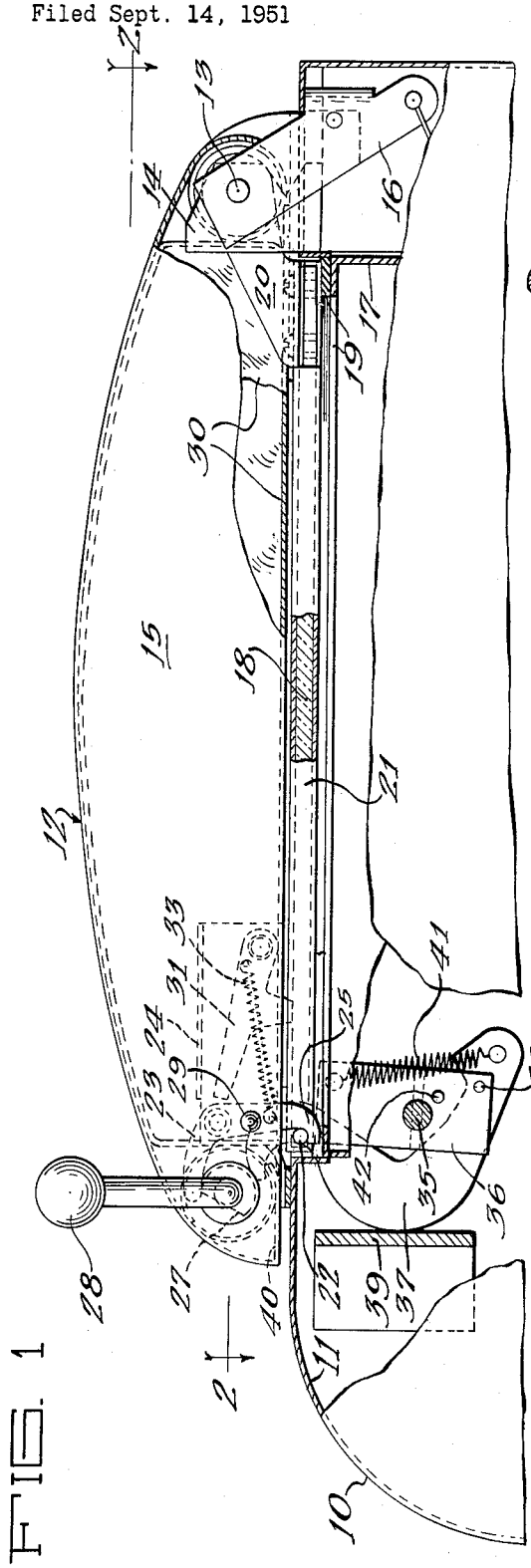


FIG. 1

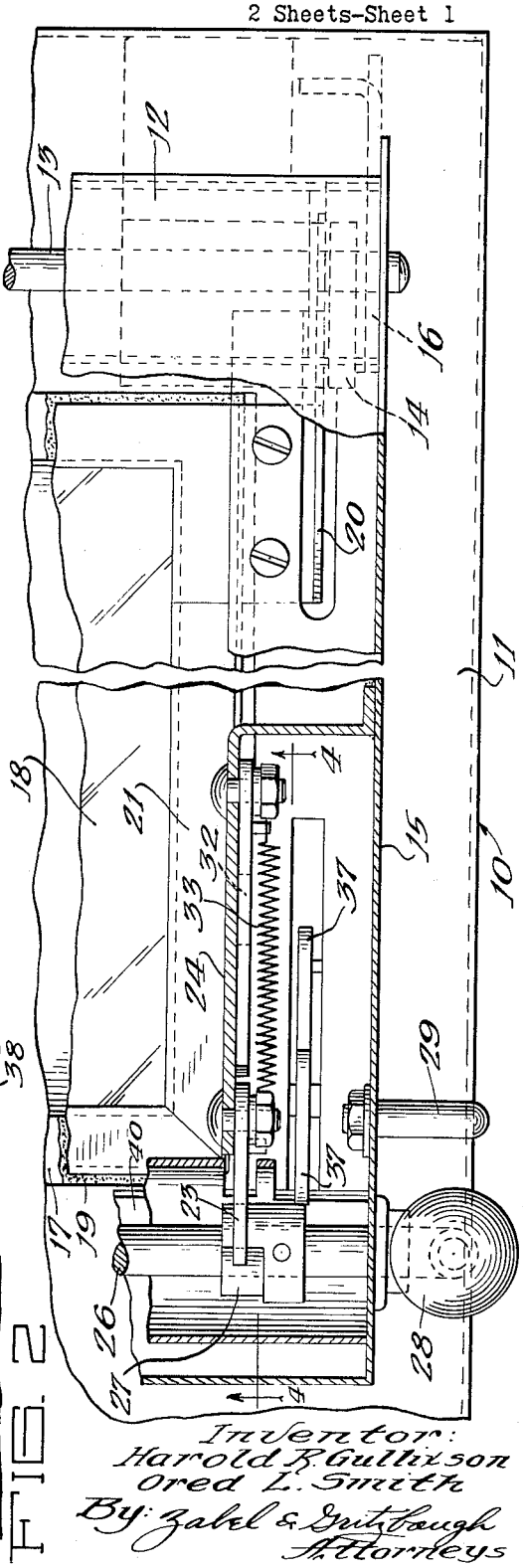


FIG. 2

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FIG. 3

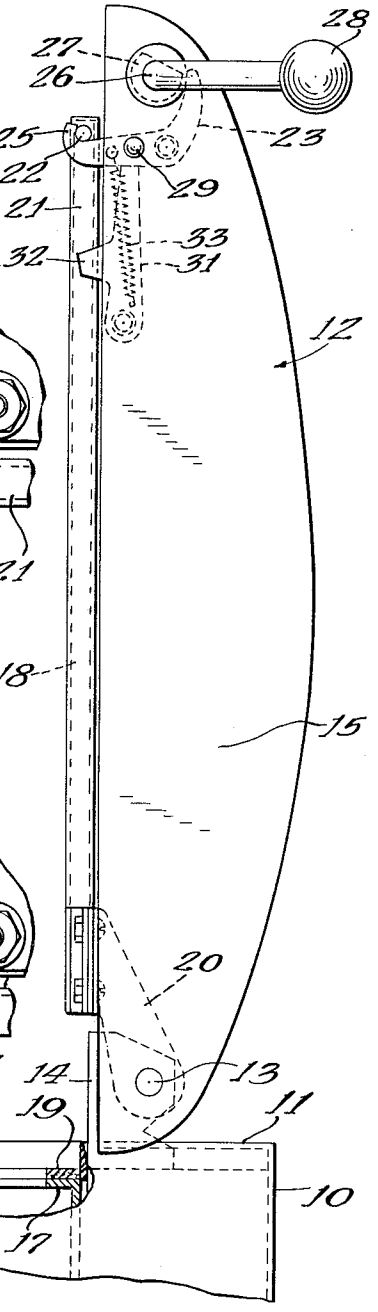


FIG. 4

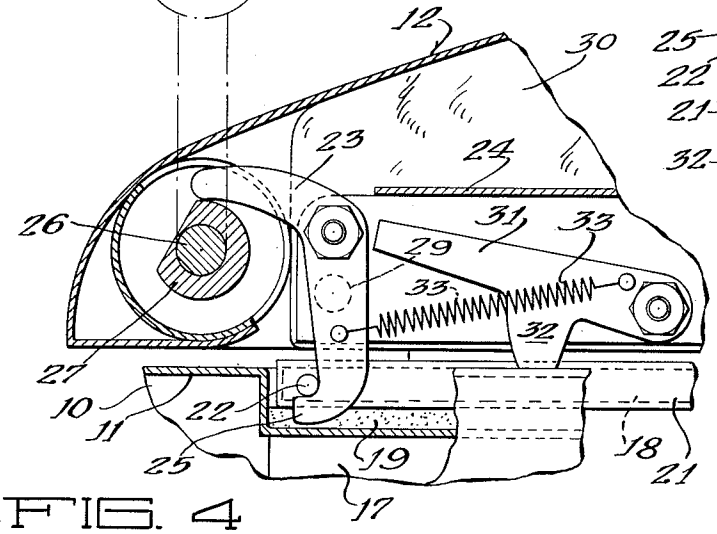
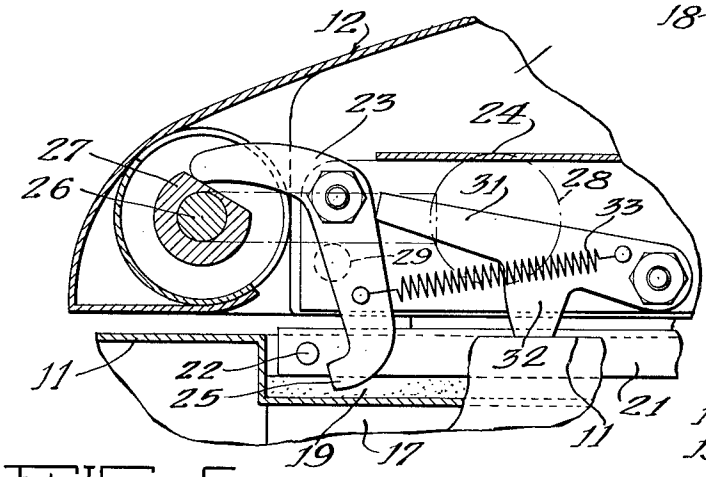


FIG. 5



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CONTACT PRINTER

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Application September 14, 1951, Serial No. 246,669

5 Claims. (Cl. 95—73)

This invention relates to contact printers and like devices for making photographic prints from negatives; in particular, it relates to an improvement in the type of contact printer shown in the co-pending application of Harold R. Gullixson, Serial No. 246,668, filed concurrently herewith.

In that application, there is disclosed a printer embodying a pneumatic cushion. The pneumatic cushion serves to hold a print and a negative, or a master sheet and a negative, in close contact with each other by pressing them against a transparent print supporting surface, such as a sheet of glass.

In making such prints, it is often desired to expose one portion of the print and negative for a longer period of time than other portions in order to bring out high lights or otherwise to improve the quality of the print or master sheet. This can be accomplished by masking out a portion of the negative. To do this the exposure period is divided into two sub-periods, and the mask is placed over the negative during the interval between these two sub-periods.

To avoid disturbing the relationship between the print and the negative, which would occur if the pneumatic cushion were released, the mask can be secured to the opposite or underside of the transparent print supporting surface. However, in certain types of printers, including that shown in the aforesaid pending application, the underside of the glass sheet is not readily accessible. The glass sheet is located in the base of the printer, and is disposed above the light source. This horizontal disposition of the glass sheet, together with the fact that it is enclosed within a base, makes the undersurface of the glass sheet comparatively inaccessible; furthermore, if openings were provided in the base to improve accessibility, the mask could not be positioned with any accuracy due to the arrangement of the parts.

It is an object of the present invention to provide a printer in which the undersurface of the transparent print supporting surface is readily accessible so that masking means may be applied thereto.

Another object of this invention is to provide a transparent print supporting surface which can be moved with the cover without destroying the pressure engagement between the transparent surface and the pneumatic cushion, to the end that the undersurface of the transparent print supporting means is readily accessible.

The present invention contemplates a hinged mounting of the transparent print supporting means on the base together with latching means for securing the transparent means to the cover after pressure engagement has been obtained. Thus, when it is desired to apply masking means, the cover and the transparent means can be raised as a unit.

Still another object of the present invention is to provide means which automatically prevent the release of said latching means when the cover is in elevated position. Thus, the transparent print supporting means cannot drop away from the cover and break.

Other objects, features and advantages will become apparent as the description proceeds.

With reference now to the drawings in which like reference numerals designate like parts:

Fig. 1 is a side elevation of this invention as applied to a printer of the type shown and described in the aforesaid pending application, the sheathing of the base and the end plate of the cover being partially broken away so as to more clearly illustrate the underlying parts;

Fig. 2 is a plan sectional view taken along line 2—2 of Fig. 1;

Fig. 3 is an elevation similar to Fig. 1 but showing the parts in changed position, the cover being raised;

Fig. 4 is an enlarged detail section taken along line 4—4 of Fig. 2 showing the cover in operative position, with the latch engaged, and

Fig. 5 is a view similar to Fig. 4, but showing the latch disengaged.

The printer comprises a base **10** having a top surface **11**. A cover **12** is hingedly mounted on the base, by means of a hinge rod **13**. The latter is supported in a pair of hinge brackets **14** which are mounted on suitable structural members, not shown. The cover includes a pair of side plates **15** through which the hinge rod **13** passes. Tail strips **16** are secured to the side plates **15** to reinforce the end plates at the pivot point and to provide a means to which a counterbalancing spring can be anchored. The function and relationship of the foregoing elements is pointed out in greater detail in the aforesaid copending application to which reference is hereby made.

The top surface **11** is provided with an opening which is defined by a supporting frame **17** made of channel members. A suitable light source, not shown, is disposed beneath the frame. A transparent print supporting surface in the form of a sheet of glass **18** is disposed in the opening and above the supporting frame **17**, the frame forming a support for the glass, and a rubber gasket **19** being interposed between the two.

The glass is hingedly connected at its rear edge to the hinge rod **13** by means of brackets **20**. The transparent print supporting means **18** includes marginally disposed channel members which form a frame **21** which engage the edge of the glass sheet and which provide means to which the brackets **20** may be attached. Thus, although in its normal position, the glass **18** rests on the supporting frame **17**, it may be raised with the cover so as to make accessible its undersurface.

Means are provided for engaging glass **18** by the cover so that the two may be raised as a unit without destroying the pressure engagement between the glass and a pneumatic cushion **30** which is carried by the cover. For this purse, the frame **21** is provided with pins **22** which are engaged by latching means in the form of a bell crank lever **23**. The latter is pivotally mounted on a bracket **24** disposed in the cover **12**. The bell crank lever is provided with a hooked end **25** which is adapted to engage the pins **22**. This latching mechanism, together with its associated parts are doubled on both sides of the cover, and since they are identical to each other, only one will be described in detail.

An operating shaft **26** is suitably journaled in the cover and carries cams **27** which engage the bell crank levers **23** to cause the hooked ends thereof to be rotated into or out of engagement with the pins **22**. The operating shaft, at its outer end, is bent over and provided with a knob **28**. A member projects from the side of the cover to provide a rest **29** on which the control knob may rest to maintain the cam in the Fig. 5 or unlatched position.

When the knob is raised to the upright position as shown in Figs. 3 and 4, the latch engages so that the glass **18** will move with the cover.

In order to prevent inadvertent release of the latch when the cover is in its raised position, means are provided for locking the latch in its latched position. This locking means comprises a blocking member **31** which is pivotally mounted on bracket **24**, and which is provided with a depending portion **32** which projects downwardly through the cover and engages the top surface **11** of the base. As shown in Figs. 3 and 4, when the cover is down in its operative position, the locking lever is elevated, so as to permit movement of the bell crank in and out of latched position. However, when the cover is raised, the blocking lever drops downwardly into blocking position in which it engages the bell crank and blocks the same, thereby locking in latched position. Thus, even though the knob **28** is manipulated when the cover is raised, the bell crank lever cannot be rotated. A spring **33** extends between the bell crank lever **23** and the blocking lever **31** and serves the double purpose of biasing the bell crank lever into unlatched position, and of biasing the blocking lever into locking position.

As indicated above, the cover **12** includes a pneumatic cushion **30** which, when inflated, is bowed outwardly to provide a convex surface. In normal position, the glass **18** rests on the frame **17** in a horizontal position. As the cover is lowered into its operative position, as shown in Fig. 5, the contact between the cushion and the glass causes the cushion to be compressed. Since the compression of the cushion requires considerable force even though a low pressure cushion is used, clamping means are provided to engage the cover and to draw it downwardly through the last few degrees of its movement into its operative position. This clamping means comprises a clamping bar **35** which is suitably journaled in the base and to which is secured a pair of cranks **36**. S-shaped hooks **37** are pivotally mounted on the cranks by means of pivot pins **38**. This arrangement is doubled on both sides of the machine, only one of the clamping means being shown in Figs. 1 and 2. A stop plate **39**, secured to the side wall of the base, is engaged by the hook **37** and serves to maintain the same in an upright position so that rotation of the crank, when in its down position as shown in Fig. 1, will cause the hook to move downwardly. At this time, the hook engages a flange portion **40** of the cover **12**, with the result that the cover is urged downwardly with considerable force into its operative position. The S-shape of the hook permits the crank to be swung into an overcenter position so that the cover will remain clamped in its operative position.

The operation of the clamping means is described in greater detail in the aforesaid co-pending application. It will be observed that a spring **41** extends between the tail of the clamp and the crank which serves to urge the hook forwardly into engagement with the flange portion **40** and into engagement with the stop plate **39**. A pin **42** limits the counterclockwise movement of the hook with respect to the crank so that when the clamping shaft **35** is rotated 180° in the clockwise direction from the Fig. 1 position, the hook will be rotated backwardly and downwardly to a point where it is retracted within the base.

To summarize the operation, a print and negative, after being aligned, are first laid on the glass **18**, the cover at this time being raised. Then the cover is lowered and the clamping shaft **35** is rotated so as to engage the cover and draw it down into its operative position, against the pressure of the cushion. Now the glass and the cushion are in pressure engagement with each other.

Assuming that it is desired to expose one portion of the print for a short period and the other portion for a longer period, the timer of the print is set for the short period, and the entire print is automatically exposed for this short period. Then, the control knob **28** is rotated

in the counterclockwise direction from its Fig. 5 position to the Fig. 4 position which causes bell crank levers **23** to engage the pins **22**, thereby latching the glass to the cover. Then the clamping shaft **35** is rotated to release and retract the hooks **37**. However, this does not release the pressure engagement between the cushion and the glass due to the latched condition of these parts.

The cover may now be elevated into its Fig. 3 position. The elevation of the cover automatically causes the blocking levers **31** to engage the bell crank levers, thereby locking the latch in their latched positions. This avoids inadvertent release which might cause the glass to break.

When the cover is in its raised position, masking means may be secured to the underside of the glass **18** by suitable means, such as pressure sensitive tape. Then, the cover is brought back down into its operative position, and the clamp shaft **35** is rotated so as to secure the cover in this position. The timer is then set for the remainder of the exposure period, so that the unmasked portion of the negative and print may receive the desired additional exposure.

In releasing the parts, after exposure, the glass is unlatched prior to release of the clamping means so as to achieve a gradual release of the pressure engagement.

If desired, the additional exposure of the unmasked portion can be effected during the first exposure period, and the mask removed during the interval prior to the second exposure period.

The disclosure of the aforementioned copending application, insofar as consistent, is hereby incorporated in this application by reference.

Although only a preferred embodiment of our invention is shown and described herein, it will be understood that various modifications and changes may be made without departing from the spirit of our invention as pointed out in the appended claims.

We claim:

1. A contact printer comprising a base, transparent print supporting means normally disposed on said base, a cover movably mounted on said base and having cushion means for cooperation with said transparent means, hinge means connecting said cover to said base, said transparent means being hingedly mounted on said cover so that said transparent means may be moved with said cover away from said base, clamping means for drawing said cover into operative position against said base so that said cushion means is forced into and maintained in pressure engagement with said transparent means, and latching means mounted on said cover for engaging said transparent means when said cover is clamped in its operative position so as to maintain said transparent means and said cushion in pressure engagement with each other after said clamping means is released to permit said cover and transparent means to be removed from said base without destroying said pressure engagement.

2. A contact printer comprising a base having an opening formed in its top surface, transparent print supporting means normally disposed in said opening, pivot means mounted on said base, a cover hingedly mounted on said pivot means and having cushion means for cooperation with said transparent means, clamping means for drawing said cover into operative position against said base so that said cushion means may be forced into and maintained in pressure engagement with said transparent means, said transparent means being hingedly mounted on said pivot means for movement with said cover into a raised position, and latching means mounted on said cover for engaging said transparent means when said cover is clamped in its operative position so as to maintain said transparent means and said cushion in pressure engagement wtih each other after said clamping means is released to permit said cover and transparent means to be raised as a unit.

3. A contact printer as claimed in claim 2 having

means for locking said latching means in latched position when said cover is raised.

4. A contact printer as claimed in claim 2 in which said latching means comprises a latching member mounted in said cover and movable between a latched and a released position, and locking means engaging said pivoted latching member when it is in its latched position to maintain the same in said latched position.

5. A contact printer as claimed in claim 4 in which said locking means comprises a blocking member mounted for engagement with said latching member and movable between an operative position and an inoperative position, said blocking member including a portion projecting through said cover into engagement with said

base whereby said locking member is maintained in its inoperative position by the engagement of said projecting portion with said base when said cover is in its operative position, said blocking member being movable into its operative position as movement of said cover away from said base permits said projecting portion to be projected through said cover to a greater extent.

References Cited in the file of this patent

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