Aug. 31, 1965 E. C. WOODCOCK ETAL 3,203,311

NEGATIVE SUPPORT FOR PROJECTION PRINTERS

Filed Jan. 29, 1963 2 Sheets-Sheet 1

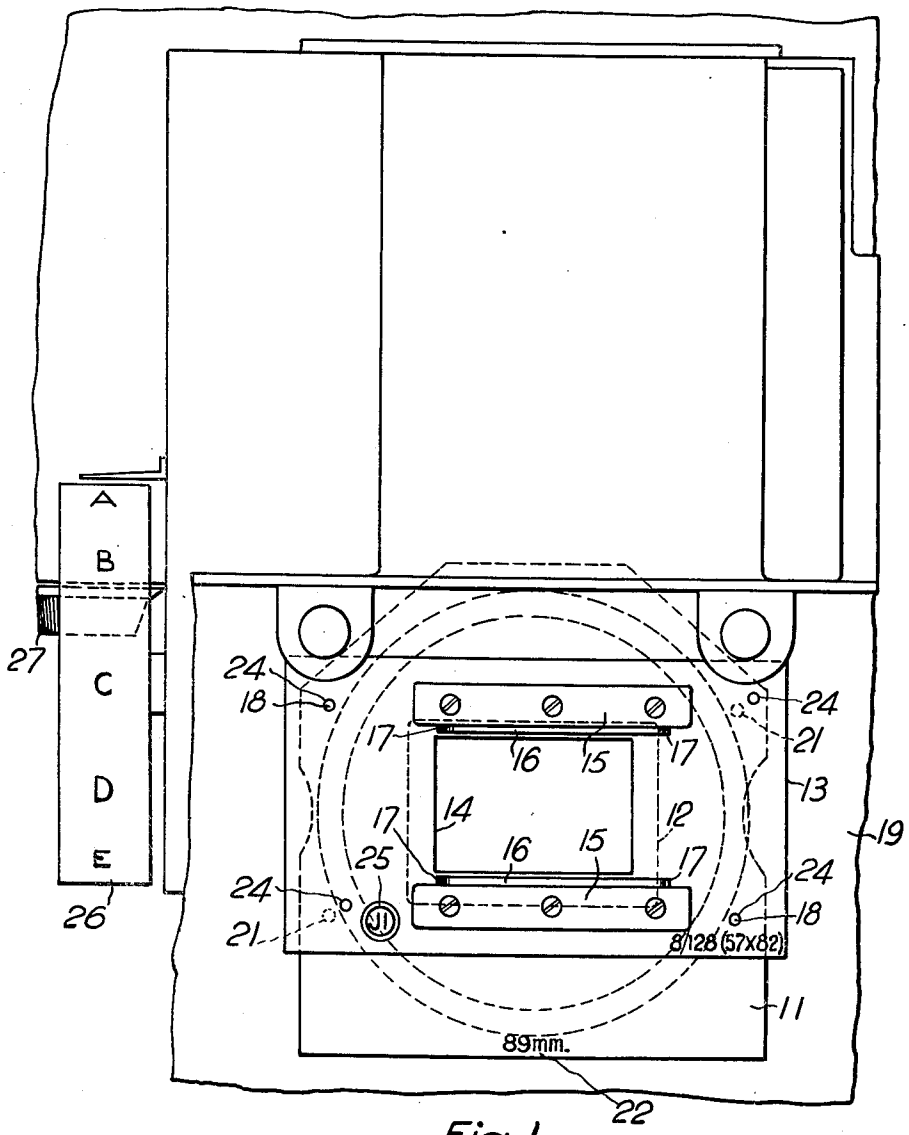


Fig. 1.

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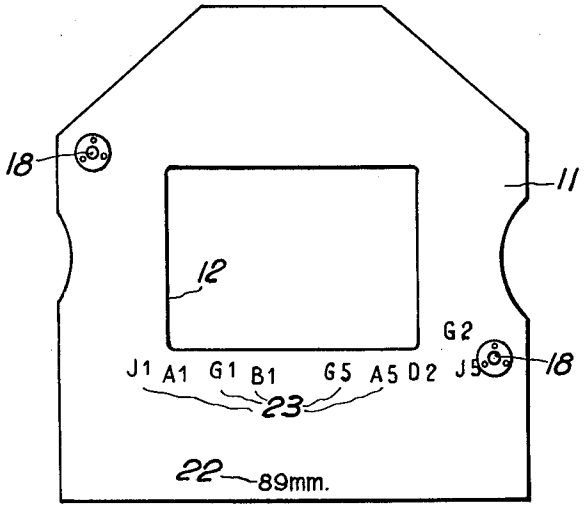


Fig. 2.

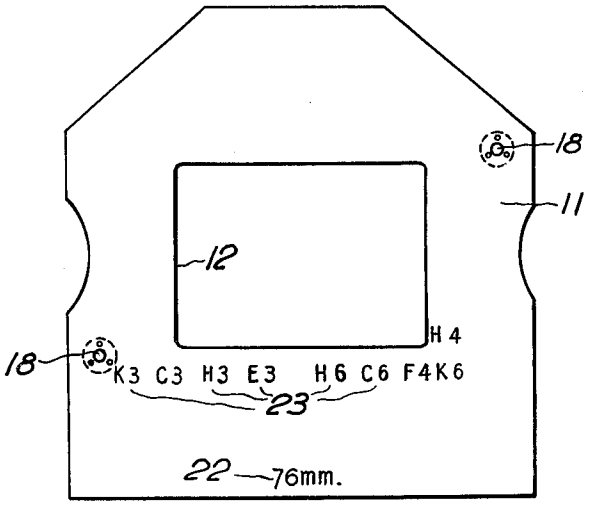


Fig. 3.

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NEGATIVE SUPPORT FOR PROJECTION PRINTERS

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2 Claims. (Cl. 88—24)

This invention relates to photographic projection printing apparatus using sensitized material, usually paper, which may be one of several different widths, drawn from a long supply, provided with a paper feed of adjustable value set in action at each exposure, provided with adjustable magnification ratio, and intended to make prints from any of a series of standard size negatives, on the particular width of the paper being supplied.

The negatives are usually film negatives and the apparatus must be provided with a support to hold the negative in the right plane and in the right position in that plane. As the paper is in a long length of constant width, if the image is to occupy the full width, the ratio of enlargement must be adjusted to suit the width of negative, while if waste or overlap is to be avoided, the paper feed must be adjusted according to the proportions of the negative. There will thus be, for every size of negative, as many adjustments of ratio and of feed as there are widths of paper.

To deal with this the present invention provides a negative support for each size of negative having an aperture appropriate to the negative size and means for locating the support in the correct position in the apparatus, having regard to the particular width of paper being used. It would be possible to construct the support and its mounting in the apparatus so that when located in position it automatically operated the ratio adjustment and the feed adjustment but this would involve complicated mechanical, electrical or other devices which are expensive and also liable to wear or to develop faults. It is preferred therefore to leave these adjustments to be made manually, but to arrange that when the negative support is in place, an indicator directs the attention of the operator to a symbol or symbols peculiar to the particular negative size and the width of paper in use. Two manually operated adjusting members are provided with dials or the like marked with the corresponding symbols so that when each is set in accordance with that or those indicated, the magnification ratio and feed are given the appropriate values.

If a different adjustment of both ratio and feed were necessary for every case to be provided for, it would suffice to provide a single (different) symbol for each case, when both adjusting members would have dials or the like marked with the same symbols. But the sizes of negatives and widths of paper in commerical use involve some settings which differ only in ratio but not in paper feed and others which differ not in ratio but only in paper feed, which makes the use of single symbols inconvenient if not practically impossible and accordingly separate symbols are used for ratio and feed. In any case arbitrary symbols at the requisite locations are used i.e. not simple uniformly graduated dials, and to avoid risk of confusion the two sets of symbols are of different character say numerals for one and letters for the other.

There is a separate support for each size of negative and this might carry a respective pair of symbols for each paper width, an exchangable indicator corresponding with the paper width being provided on the apparatus. But if as is preferred the indicator is a window so that only the appropriate pair of symbols is revealed, this arrangement

of the symbols on the negative supports might make their positioning in the apparatus awkward and it is simpler to provide a complete set of symbols for each paper width on a respective separate adaptor plate marked with the width and having a light opening of the largest size needed. This is first located in the printer, and the negative support is then located on the adaptor plate when a window in the negative support reveals the correct pair of symbols while all others are covered.

Location may be by pegs and holes, and parts associated with the paper supply, which have to be adjusted or changed to suit the paper width, may be arranged to move a sliding plate which uncovers the appropriate holes for the pegs on the adaptor plate.

Each adaptor plate may be reversible and thus arranged to suit two different paper widths, and it may then have pegs projecting from both faces, the pegs projecting from one face serving to locate the plate in the apparatus and then projecting from the other face to locate the negative support on the plate. The plate is marked on both faces with the respective symbols. There may be two pegs on each face and those on one side may be in alignment with those on the other. In many practical cases, only two paper widths in all have to be provided for, common commercial sizes being 3 inches (76 mm.) and 3½ inches (89 mm.), and in that case only a single adaptor plate is needed.

An example of the invention is illustrated in the accompanying drawings in which

FIGURE 1 is a plan view of the negative holder in place in the printing apparatus, only a small portion of the apparatus being shown,

FIGURE 2 is a plan view of the adaptor plate alone in the same position as it occupies in FIGURE 1 and

FIGURE 3 is a plan view of the adaptor plate reversed in relation to FIGURE 2.

The apparatus itself apart from the negative holder and the markings necessary on the manual adjusting members for magnification ratio and paper feed may be on well known lines and is therefore not illustrated apart from the portion which receives the negative holder. It is assumed that the negative is illuminated from below.

The holder comprises an adaptor plate **11** having a light opening **12** adequate for the largest negative to be dealt with, and a set of negative supports for film negatives, one for each size of negative but only one of which is shown, marked **13** in FIGURE 1. Both the adaptor plate **11** and the support **13** are suitably made of stout sheet aluminum or aluminum alloy. Each support **13** has a light aperture **14** of the correct size for the negative and the negative is held on the support between a pair of runnners **15** secured to the support and having narrow flanges **16** which engage the margins of the film without hindering longitudinal movement, thus enabling the operator to work with a set of negatives which are still on a single length of film. The ends of the flanges may be upturned as at **17** to facilitate leading in of the film and such ends press down with light spring pressure to hold the film flat. Longitudinal adjustment may be effected manually by reference to the light aperture **13** in the support, and low illumination may be used to facilitate this. For example the illuminating means for the negative may have a control, or a separate light source of low power may be provided.

To locate the adaptor plate on the printing apparatus the adaptor plate **11** is provided with two pegs **18** which project from both faces. These pegs enter holes in the table surface **19** of the apparatus. The holes are positioned to bring the opening **12** into a suitable position according to the width of paper being used and to avoid the risk of the pegs being entered into the wrong holes,

without the need for additional devices, as might arise if the pegs were disposed on a longitudinal or transverse centre line of the opening **12**, they are disposed on an inclined line so that the respective pairs of holes are disposed well apart and on two lines which cross at a large angle. FIGURE 2 shows the adaptor plate in the same disposition as FIGURE 1 and the pair of holes which are not occupied by the pegs are marked **21**. When the plate **11** is turned over to the position of FIGURE 3, the pegs will enter these holes **21**.

The plate **11** carries on each face a legend **22** indicating the particular width of paper to which it corresponds when set with the face uppermost. Desirably the plate **11** is of such size and the legend **22** is so placed that it will not be obscured by any of the negative holders. The plate also carrries on each face a set of pairs of symbols **23** each pair comprising a letter and a numeral.

The negative supports **13** are each provided with four holes **24** corresponding with the position of the pegs **18** whichever way up the plate **11** may be placed, and a window **25** of a size to reveal one of the pairs of symbols **23**.

The aperture **14**, symbols **23**, holes **24** and window **25** are so located in relation to one another that when the support **13** is in place, a pair of symbols **23** corresponding to the required ratio of magnification and paper feed for the width of paper and size of negative is revealed in the window **25** and all other pairs of symbols **23** are concealed.

The apparatus is equipped with two manual adjusting members in the form of rotatable knobs **26**, **27** respectively for setting the magnification ratio and the paper feed, and these members are respectively marked in letters and numerals. When the adaptor plate has been set the correct way up for the width of paper, and the correct negative support has been put into position, the operator only has to set the two members **26**, **27** to the letter and number respectively revealed in the window **25** to obtain the correct ratio of magnification and correct paper feed. With the particular setting of the plate **11** and particular negative holder shown in FIGURE 1 the letter is J and the numeral is **1**.

The legends and double symbols indicated in FIGURES 2 and 3 refer to common standard sizes of paper and magnification ratio. It will be seen that some of the letters are used more than once and some of the numerals more than once but every complete double symbol appears only once. This is because more than one standard size requires the same feed or the same ratio of magnification. If a single different symbol were provided for every case, this would involve using several symbols for indicating the same setting of each of the two

controls which would be inconvenient or even impracticable.

If more than two widths of paper are to be provided for, an additional adaptor plate or plates will be needed, each of which can be reversible to provide for two widths. By suitably disposing the pegs, no additional holes will be needed in the table surface **19**.

We claim:

1. In a photographic projecting printing apparatus adapted to use sensitized material of more than one width from a long supply, comprising a reversible removable adaptor plate corresponding to a particular width of sensitized material use in said apparatus, a negative support removably mounted upon said adaptor plate, means on said plate and said support thereby locating said support on said adaptor plate, said adaptor plate and negative support each having an aperture therein with the aperture in the adaptor plate being larger than the aperture in the negative support, said negative support having a window therein, a series of pairs of symbols on each face of said adaptor plate, each symbol of a pair indicating a magnification ratio and film feed respectively necessary for an exposure of the sensitized material to a negative supported in said support, said window located above said series of symbols in a position determined by the particular negative support used and allowing a pair of said symbols to be visible through said window, and manual adjusting means with a series of symbols corresponding to the symbols on the adaptor plate for setting the magnification ratio and paper feed in said apparatus indicated by the pair of symbols visible through said window.

2. In a photographic projecting printing apparatus according to claim **1**, in which the adaptor plate has two faces and the first-mentioned means includes two pegs projecting from one face of the adaptor plate which are in alignment with those on the other face, and the pegs being disposed on a line which is inclined with respect to the sides of the negative, said first-mentioned means also including holes in the negative support to engage the pegs to locate it in the correct position on the adaptor plate.

References Cited by the Examiner

UNITED STATES PATENTS

2,260,672	10/41	Johanson	88—24
2,496,329	2/50	Briechle et al.	88—24 X

FOREIGN PATENTS

781,090	8/57	Great Britain.

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