July 23, 1957 S. LIGHTBOURN 2,800,078

FEED GUIDE FOR PRINTING EQUIPMENT

Filed Jan. 31, 1955

FIG. 1.

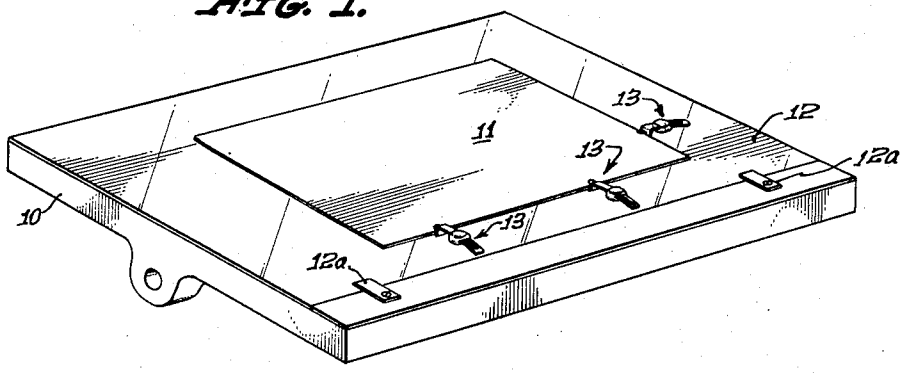


FIG. 2.

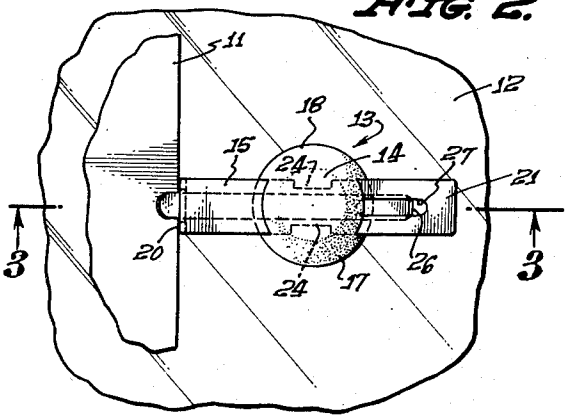
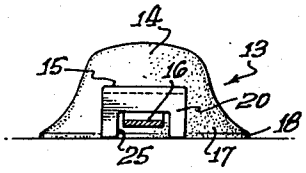


FIG. 4.



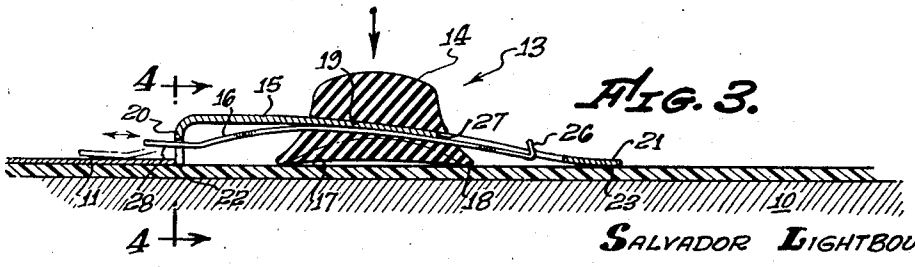


FIG. 3.

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United States Patent Office

2,800,078

Patented July 23, 1957

2,800,078

FEED GUIDE FOR PRINTING EQUIPMENT

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Application January 31, 1955, Serial No. 484,889

10 Claims. (Cl. 101—415)

This invention relates to improved feed guide devices for use in conventional embossing or platen printing presses.

In using an embossing or printing press, it is customary to provide, on the platen of the press, a sheet of material called a "feed board" or "tympan" on which the paper to be impressed is placed during the printing or embossing operation. The paper is properly located on this feed board or tympan by positioning the paper to abut laterally against a number of feed guide devices (usually three). These guide devices are ordinarily attached to the feed board or tympan by means of pins or hooks which extend through or into the feed board or tympan, and usually damage it to an extent preventing its re-use.

The general object of the present invention is to provide an improved feed guide arrangement, in which the guide devices may be attached to or removed from a feed board much more easily than in the past, and without any damage to the board, so that a single board may be used repeatedly over a long period of time without replacement. This result is achieved by employment of a unique type of feed board having a very smooth or slick surface, in combination with specially constructed feed guide units having suction cup portions which are adapted to adhere by suction to the slick board.

Each of the feed guide units includes an element which laterally engages and thereby determines the positioning of a sheet of paper, and which is carried by the suction cup at a location to contact the feed board when the suction cup is attached to the board. This element may be a leaf spring, and preferably engages the feed board at two opposite sides of the suction cup, rather than merely at one side, to balance any forces which may be exerted by the element against the cup, and to thereby prevent accidental detachment of the cup from the feed board as a result of such unbalanced forces. The unit may also include a second element, typically a second leaf spring, carried by the suction cup and projecting to a position overlying the paper, to retain the paper against the board. This second element may be mounted for adjusting movement, to vary both the extent to which it overlies the paper, and the thickness of paper or cardboard which can be handled.

Both of these paper engaging elements may be attached to the suction cup in unique and very effective manner by actually passing the elements directly through the rubber or rubber-like material of the suction cup. The first mentioned of the elements is preferably fixed relative to the suction cup body, while the second element is free for limited sliding movement to effect the desired adjustment in its position.

The above and other features and objects of the present invention will be better understood from the following detailed description of the typical embodiment illustrated in the accompanying drawing in which:

Fig. 1 is a perspective view of an embossing or printing press platen with the paper guiding or positioning apparatus of the present invention positioned thereon;

Fig. 2 is an enlarged fragmentary plan view of one of the feed guides of Fig. 1;

Fig. 3 is a further enlarged vertical section taken on line 3—3 of Fig. 2; and

Fig. 4 is a vertical section taken on line 4—4 of Fig. 3.

In the drawing, I have shown at **10** the platen of a conventional printing press or embossing press. This platen is provided for supporting a sheet of paper **11** while that sheet is printed or embossed. The paper **11** is placed on the upper surface of a feed board **12** on the platen, with the paper being properly positioned on the feed board by engagement with a number of feed guides **13**.

The feed board **12** takes the place of the usual paper "tympan" in a printing press, and of the conventional cardboard feed board in an embossing press. This feed board **12** may be of a rectangular configuration, and is held in proper position on platen **10** by any suitable type of retaining elements, typically represented as a pair of clamps **12***a* such as are used conventionally in embossing presses. Feed board **12** has an upper flat surface which is smooth, nonporous, and preferably glassy or slick, so that the suction cup guide units **13** will positively adhere thereto. In embossing presses, feed board **12** is desirably of a fairly stiff material, and adapted by virtue of its own stiffness to avoid deformation when the suction cup elements **13** are attached to the feed board. In printing presses, the feed board **12** may be formed of a slick surfaced but flexible sheet material, which is held tightly against the platen in flattened condition by clamps of the type customarily used in holding conventional paper tympans. For these purposes, the material forming feed board **12** may be a suitable slick surfaced plastic, mica, Celluloid, wax treated paper, sheet plastic such as acetate, or plastic treated paper, or in the case of embossing presses, a suitable linoleum may be used.

There are normally provided three of the feed guide units **13** on feed board **12** for engaging and properly positioning the usually rectangular sheet of paper **11** to be printed or embossed. One of the feed guides **13** engages one edge of the paper **11** near a corner of that paper, while the other two feed guides **13** engage a second edge of the paper. Referring especially to Figs. 2 to 4, each feed guide unit **13** includes a body **14** formed of resiliently deformable material such as rubber, a lateral guide element **15** for engaging an edge of the paper, and a tongue element **16** for overlying the edge portion of the paper. The lower portion of body **14** forms a downwardly facing concave resiliently deformable suction cup **17**, having an annular sealing lip **18** about its central suction cup recess and which is adapted to adhere tightly to the upper slick surface of feed board **12**. In the normal undeformed condition of body **14**, the sealing lip **18** of course extends farther downwardly at the edge of the suction cup recess than in the applied or deformed Fig. 3 condition, so that the recess normally forms a considerably deeper cavity in body **14** than is shown in Fig. 3. Above its lower suction cup portion, body **14** is relatively thick, and contains a passage **19** extending transversely or essentially horizontally therethrough, and through which elements **15** and **16** extend.

Element **15** may be a somewhat elongated leaf spring, typically formed of a suitable resiliently deformable spring steel, and having an end portion **20** which is turned downwardly or directly toward feed board **12** in the position of use. A second and outer end **21**, at an opposite side of the suction cup body **14**, extends gradually downwardly to engage the surface of the feed board as seen in Fig. 3. In the position in which suction cup body **14** is attached by suction to the surface of feed board **12**, both of the ends of leaf spring element **15** preferably bear against the surface of the feed board, specifically at points **22** and **23**. At a location within body **14**, leaf

spring 15 has a portion which is notched inwardly at its opposite sides 24, and the passage 19 in body 14 is correspondingly reduced in width to provide projections fitting into notches 24 to positively retain element 15 against longitudinal movement relative to body 14. During insertion of element 15 into its proper position within body 14, the latter is of course stretched sufficiently at passage 19 to allow the wider portion of element 15 to slip into passage 19 to a point at which notches 24 in element 15 engage and are retained by the reduced dimension portions of element 19.

Tongue 16 may also take the form of a somewhat elongated leaf spring typically formed of resiliently deformed spring steel. Element 16 extends along the underside of element 15 and is of a smaller width than element 15. At its inner end, tongue 16 extends through a recess or cutaway portion 24 in the down-turned portion 20 of element 15, so that the inner end of tongue 16 overlies an edge portion of the paper 11. At its outer end, element 16 has an upturned portion 26, which extends upwardly through and beyond an elongated slot 27 in the outer portion of element 15 and is actuable in opposite directions by the fingernail of a user to move element 16 longitudinally relative to element 15.

The passage 19 in body 14 is of a vertical dimension corresponding to the combined thicknesses of elements 15 and 16, to effectively confine those elements, and locate them relative to body 14. Preferably, passage 19 and the portions of elements 15 and 16 contained in that passage all have a common slight arcuate curvature about an axis spaced well below the feed board (with the feed board in horizontal position), so that actuation of element 16 to the left as seen in Fig. 3 tends to swing the inner end portion 28 of that element downwardly, in addition to advancing that element to a position overlying paper 11 to an increased extent.

In using the illustrated apparatus, a first step is of course to place feed board 12 on platen 10, and then clamp the feed board to the platen. The three feed guide units 13 are then properly positioned on feed board 12, and each is attached to the feed board by pressing downwardly on the upper surface of body 14 until its suction cup portion 17 adheres tightly to the upper surface of board 12. This adhesion may of course be enhanced by slightly moistening suction cup 17. The sheet 11 to be printed or embossed is moved to a position in which two of its edges engage the down-turned portions 20 of elements 15 of the units 13, with the paper being received beneath the projecting ends of tongues 28. Guide units 13 then act to retain sheet 11 in a proper position during the printing or embossing operation, following which the sheet 11 may be easily removed, and another sheet placed in proper position against units 13. The operator may adjust each element 16 longitudinally, as between the full line and broken line positions of Fig. 3. Such longitudinal adjustment of element 16 varies the extent to which that tongue element overlies the paper 11, and also serves to vary the spacing of the projecting end 28 of element 16 above feed board 12. This adjustment of the inner end 28 of element 16 toward and away from the feed board occurs by reason of the previously described slight arcuate curvature of body passage 19 and the contained portions of elements 15 and 16, and allows adjustment of element 16 for reception of different thicknesses of paper or cardboard between the feed board and end 28 of element 16. This thickness adjustment is extremely useful in cases where very accurate positioning of the paper is necessary, since it allows the work to be held securely against the guides despite press vibration or the presence of other conditions tending to dislocate the work. It is also noted that the engagement of outer end 21 of element 15 with the feed board acts to balance the forces exerted against the feed board by inner end 20, to maintain the suction cup body member 14 in a proper relation to the engaged feed board. In the applied condition of unit 13, the engagement of the opposite ends of element 15 with feed board 12 may serve to maintain the leaf spring element 15 in a slightly deformed condition, to assure proper engagement of element 15 with the feed board at all times.

I claim:

1. Apparatus comprising a feed board for use in a press, and a feed guide device removably attachable to a surface of said feed board, said device comprising a suction cup removably attachable to said surface, said surface of the feed board being sufficiently smooth and nonporous for the suction cup to adhere tightly thereto, a lateral guide element carried by said suction cup and engageable by an edge of a sheet of paper on the feed board to locate the paper on the board, said guide element being positioned to engage the surface of said feed board when the suction cup is attached thereto, and a tongue carried by said suction cup projecting beyond said guide element to a location overlying a paper which is against said guide element to hold said paper on the board, said guide element having a first paper engaging portion positioned to bear against said feed board at a first side of the suction cup, and a second portion bearing against said feed board at a second and opposite side of the suction cup.

2. A feed guide device for positioning paper on a feed board in a press comprising a body of resiliently deformable material having a lower portion forming a suction cup removably attachable to the surface of said feed board, a lateral guide element carried by said deformable body and engageable by an edge of a sheet of paper on the feed board to locate the paper on the board, and a tongue element carried by said deformable body and projecting beyond said guide element to a location overlying a paper which is against said guide element, said guide element being attached to said body of deformable material by extending generally transversely entirely through an upper portion of said deformable body above said suction cup portion and projecting from opposite sides thereof, said guide element comprising a leaf spring extending through said upper portion of the deformable body and having a first paper engaging end bearing against the feed board at one side of the suction cup, and a second end bearing against the feed board at a second and opposite side of the suction cup.

3. A feed guide device as recited in claim 2, in which said leaf spring guide element is turned downwardly at said first paper engaging end, said tongue being elongated and formed of resilient material and extending generally parallel to said leaf spring through said upper portion of the deformable body, said tongue being free for longitudinal movement relative to the leaf spring and body along a path for varying the extent to which said tongue overlies the paper and varying the spacing between said tongue and feed board, and said device including means for retaining said leaf spring substantially fixed relative to the body.

4. A feed guide device for positioning paper on a feed board in a press, comprising a suction cup removably attachable to the surface of said feed board, an elongated guide element carried by and extending generally transversely of said suction cup and having a first portion bearing against the feed board at a first side of the suction cup and engageable by an edge of a sheet of paper on the feed board to locate the paper on the board, said guide element having a second portion bearing against said feed board at a second and opposite side of the suction cup to balance the forces exterted by said element against the suction cup, and a tongue carried by said suction cup and projecting beyond said first paper engaging portion of the guide element to a location overlying the paper.

5. A feed guide device as recited in claim 4, in which said guide element comprises an elongated leaf spring, said first portion of the guide element comprising a down-

turned paper engaging end positioned to bear resiliently against the feed board at said first side of the suction cup.

6. A feed guide device as recited in claim 5, in which said tongue is elongated and extends essentially parallel to said guide element, and transversely of said suction cup, said device including means mounting said tongue for longitudinal adjusting movement relative to said guide element and suction cup.

7. A feed guide device as recited in claim 4, including means mounting said tongue for protracting and retracting movement relative to said guide element and suction cup.

8. Apparatus comprising a feed board for use in a press, and a feed guide device removably attachable to a surface of said feed board, said device comprising a suction cup removably attachable to said surface, said surface of the feed board being sufficiently smooth and non-porous for the suction cup to adhere tightly thereto, a lateral guide element carried by said suction cup and engageable by an edge of a sheet of paper on the feed board to locate the paper on the board, said guide element being positioned to engage the surface of said feed board when the suction cup is attached thereto, and a tongue carried by said suction cup projecting beyond said guide element to a location overlying a paper which is against said guide element to hold said paper on the board, said guide element comprising a leaf spring having a first downturned paper engaging end positioned to bear resiliently against the feed board at a first side of the suction cup, and a second end adapted to bear resiliently against the feed board at a second and opposite side of the suction cup.

9. A feed guide device as recited in claim 8 including means mounting said tongue to said suction cup for protracting and retracting movement relative to said suction cup and said guide element.

10. A feed guide device for positioning paper on a feed board in a press comprising a body of resiliently deformable material having a lower portion forming a suction cup removably attachable to the surface of said feed board, a lateral guide element carried by said deformable body and engageable by an edge of a sheet of paper on the feed board to locate the paper on the board, and a tongue element carried by said deformable body and projecting beyond said guide element to a location overlying a paper which is against said guide element, said tongue being attached to said body of deformable material by extending generally transversely entirely through an upper portion of said deformable body above said suction cup portion and projecting from opposite sides thereof, said tongue being elongated and being free for longitudinal protracting and retracting movement within a transverse passage in said upper portion of the deformable body, the portion of said tongue within said passage being slightly curved to vary the spacing between the paper engaging end of the tongue and said feed board in accordance with longitudinal adjusting movement of the tongue.

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