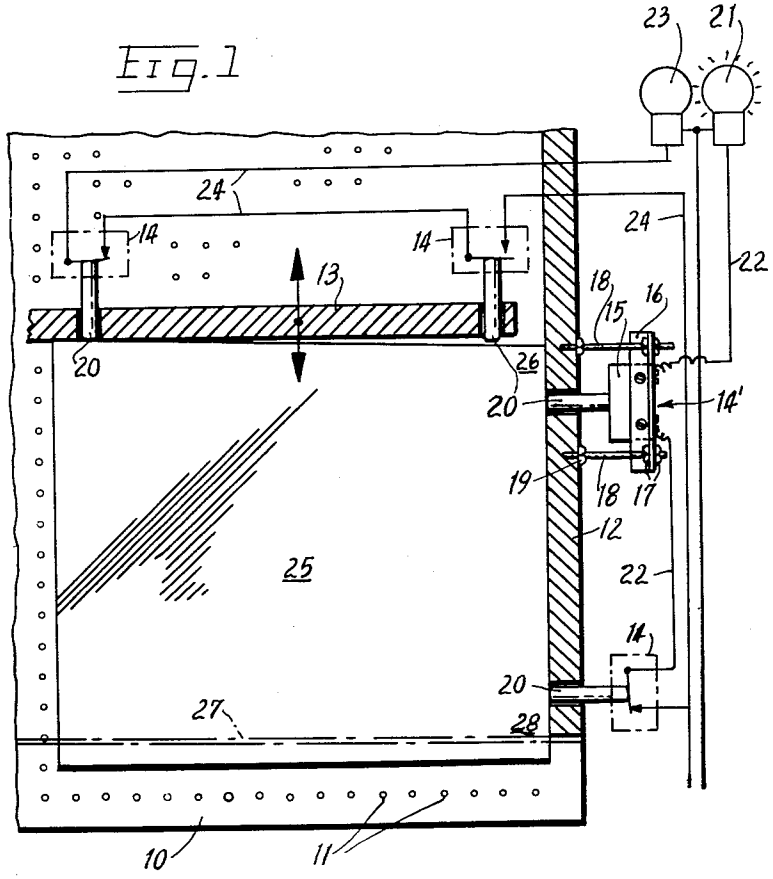
Dec. 12, 1961 R. W. MENDHAM 3,012,330

SQUARE INDICATING DEVICE FOR PAPER CUTTER

Filed April 18, 1960

Fig. 1



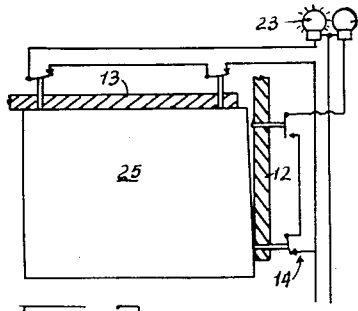


Fig. 2

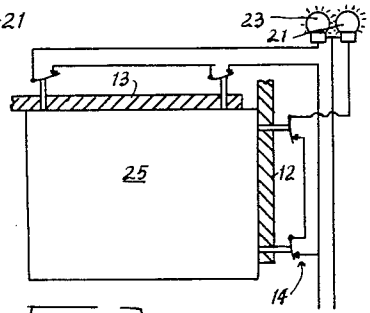


Fig. 3

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SQUARE INDICATING DEVICE FOR PAPER CUTTER

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This invention relates to a device for indicating whether a lift of paper disposed on a cutting or trimming machine is squared. Cutting or trimming machines to which the invention applies comprise a fixed side board and a movable back board arranged to be constantly perpendicular to each other. In conventional machines the lift of paper is pushed against the two boards, and the operator determines by sight or feel whether two adjacent sides of the lift are in full contact with the boards. It often happens that the paper which is to be cut or trimmed is not perfectly squared, and the operator when working rapidly may not see this. If the lift of paper is not squared the cut subsequently made is also not square, and difficulties arise in the further handling of the paper, for example in printing, particularly color printing.

The above disadvantages are obviated by the device according to the present invention, which positively indicates to the operator whether the lift of paper he is handling is squared or not. The device consists essentially of plunger actuated switches so arranged that the plungers project slightly from the boards and are adapted to close the switches when depressed flush with the boards by a lift of paper. Two switches are disposed on each board at a certain distance from each other, and the two switches of each board are connected in series in an electrical circuit with an indicating device such as a lamp. The arrangement is such that the lamp only lights when both switches of one board are closed, thus ensuring that the lift of paper is in full contact with the board. If both lamps are on, the indication is that both adjacent sides of the lift of paper are in contact with the two boards, and the lift must therefore be squared at least within the required tolerance, which corresponds to the amount by which the plungers normally project from the boards.

An embodiment of the invention is illustrated by way of example in the accompanying drawing in which:

FIG. 1 is a schematical fragmentary plan view of a cutter outfitted according to the invention, shown with a non-squared lift of paper on it, the circuits being also illustrated diagrammatically.

FIGS. 2 and 3 are similar but simplified views, showing the cutter with a lift of paper respectively non-squared and squared.

Referring to FIG. 1, numeral **10** indicates a corner portion of the cutting table which is preferably of the type comprising an air film produced by small jets **11** distributed over the table, for the purpose of lightening the work, a feature well known in the art. A side board **12** is fixed at one edge of the table, and a back board **13** is mounted by means not shown, for translatory adjusting movement, constantly perpendicular to the side board.

In accordance with the invention each of the boards **12** and **13** is fitted with a plunger and switch assembly **14**; in the drawing three of the assemblies **14** preferably of the Microswitch type are shown schematically, and one of them, indicated at **14'** is drawn in detail, the other three being identical to it.

Each assembly **14** comprises a conventional switch box **15** secured to an angle bar **16** which in turn is fastened by nuts **17** to a pair of bolts **18** screwed into the board and fastened by counternuts **19**. The switch is provided

with an actuating plunger **20** slidably mounted in a bore of the board. By means of nuts **17** the switch box can be adjusted in a position in which the plunger **20** projects slightly from the board as shown, for example, in the right hand assembly **14** of the back board **13**. The amount by which the plungers **20** project is equal for all plungers and corresponds to the required tolerance, which may be of the order of $\frac{1}{64}$ inch.

The two switches **14** secured to the side board **12** are connected in series with a lamp **21** in a simple electrical circuit **22**, and likewise the two switches secured to the back board **13** are in series with a lamp **23** in an electrical circuit **24**. The two circuits may be connected in parallel as shown, for convenience. The position of the cutting knife is indicated in broken lines at **27**.

The operation of the device is as follows: a lift of paper **25** is pushed into the corner formed by the boards **12** and **13**, to check whether it is squared or not. If the lift of paper is not squared, namely if its corner **26** is either obtuse or acute, at least one of the plungers **20** of either board is not depressed flush with the board. In FIG. 1, for example, the lift of paper is in full contact with the side board **12**, thus both plungers **20** of the side board are depressed to close the corresponding switches and the circuit **22** is closed so that the lamp **21** lights up. However, since the corner **26** is obtuse the paper is not in contact along its whole edge with the back board **13**, and one of the plungers, namely the one adjacent the corner **26**, is not depressed, so that the circuit **24** remains open and the lamp **23** does not light. A similar case is illustrated in FIG. 2, in which the lift of paper is in full contact with the board **13**, thus lighting lamp **23**, but is out of contact with the board **12**, so that lamp **21** does not light.

If the lift, on the other hand, is squared (see FIG. 3) it will lie in full contact with both of the boards, so that both lamps **21** and **23** light up. The fact that both lamps are lighted positively indicates to the operator that the lift of paper is squared. If only one or neither lamp lights, the indication is that the lift of paper is out of square. In the latter case the operator pushes the lift of paper into contact with the side board **12**, making sure that the lamp **21** is on, and then he trims the paper by means of the knife **27**, so that he obtains a square corner at **28** (FIG. 1). Next the lift is rotated through 90° bringing the corner **28** into the position formerly occupied by corner **26**; a check on whether the corner **28** is square is given by whether both lamps light up. Obviously once one corner is square, the other corners can be squared by reference to the one square corner and to the other corners subsequently trimmed square. Before each trimming cut and also before other cuts the accuracy of the reference corner placed in the position occupied in FIG. 1 by corner **26** can be checked by whether both lamps **21** and **23** are on.

It is clear that the device positively indicates that the lift is squared or not, whether the corner of the lift near the intersection of the two boards, namely the corner **26**, is obtuse as shown in the drawing or acute. In the latter case the plunger remote from the said corner will fail to be depressed. In any case if both lamps are on, it is certain that the lift of paper is squared within the required tolerance, and if one of the lamps does not light, that the paper is out of square.

Of course the invention is limited not to the above embodiment, but only by the scope of the appended claims.

What I claim is:

1. A square indicating device for a paper cutter having a side board and a back board perpendicular to each other; said device comprising at least two means spacedly mounted on each of said boards and projecting slightly therefrom in a direction normal to the surface of the

board contacted by the paper, said means adapted to be depressed flush with said board by a lift of paper when the latter is fully in contact with each of said boards and switch means connected to said depressible means for giving an indication when all of said depressible means are depressed.

2. A square indicating device for a paper cutter having a side board and a back board perpendicular to each other; said device comprising two switch means spacedly mounted on each of said boards and projecting slightly therefrom in a direction normal to the surface of the boards contacted by the paper, said switch means adapted to be closed by a lift of paper when the latter is fully in contact with each of said boards, and two circuits each of which includes in series said switch means of one board and an indicating means.

3. A square indicating device for a paper cutter having a side board and a back board perpendicular to each other; said device comprising two plungers spacedly slidably mounted on each of said boards and projecting slightly therefrom in a direction normal to the surface of the boards contacted by the paper, switches secured to said boards and adapted to be closed by said plungers when the latter are depressed flush with the boards by a lift of paper fully in contact with each of said boards, and two circuits each of which includes in series said switches of one board and a lamp.

4. A square indicating device for a paper cutter having a side board and a back board perpendicular to each other; said device comprising two plungers spacedly slidably mounted on each of said boards, means to adjust said plungers longitudinally so that they project slightly from said boards in a direction normal to the surface of the board contacted by the paper, switches secured to said boards and adapted to be closed by said plungers when the latter are depressed flush with the boards by a lift of paper fully in contact with each of said boards, and two circuits each of which includes in series said switches of one board and a lamp.

5. A square indicating device for a paper cutter having a side board and a back board perpendicular to each other; said device comprising spacedly mounted on each of said boards two assemblies each of which consists of a switch having an actuating plunger slidably mounted in a bore of the board, a support to which said switch is secured and means adjustable longitudinally of the plunger fastening said support to the board in a position wherein said plunger projects slightly from the board in a direction normal to the surface of the board contacted by the paper, said switches being adapted to be closed by said plungers when the latter are depressed flush with the boards by a lift of paper fully in contact with each of said boards, and two circuits each of which includes in series said switches of one board and a lamp.

6. A square indicating device according to claim 5, wherein said plungers are adjusted to project from said boards by a length of the order of 1/64 inch.

7. A square indicating device as set forth in claim 3, in which the said switches and plungers together form switch units of the Microswitch type.

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