United States Patent [19]

Pretz

[11] **3,791,247**

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[54] **PAPER TRIMMING MACHINE**

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[52] **U.S. Cl.** **83/418,** 83/433, 83/447, 83/477.2, 83/506

[51] **Int. Cl.** **B26d 3/12**

[58] **Field of Search** 83/418, 421, 431, 433, 434, 83/447, 446, 477, 477.1, 477.2, 505, 506, 430

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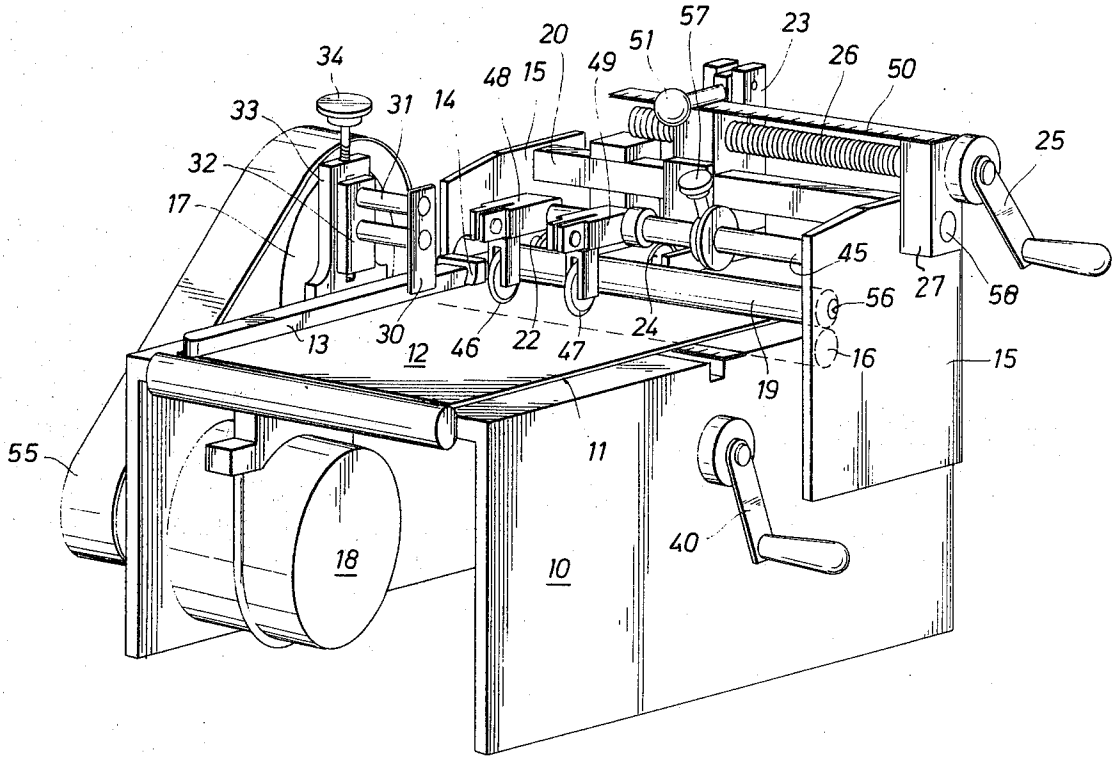
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Primary Examiner—J. M. Meister

[57] **ABSTRACT**

Apparatus for trimming paper having improved workpiece support and alignment structure. The machine accurately trims the workpiece by holding the workpiece accurately aligned with the cutter discs and advancing the workpiece rapidly through the cutter assembly.

4 Claims, 4 Drawing Figures



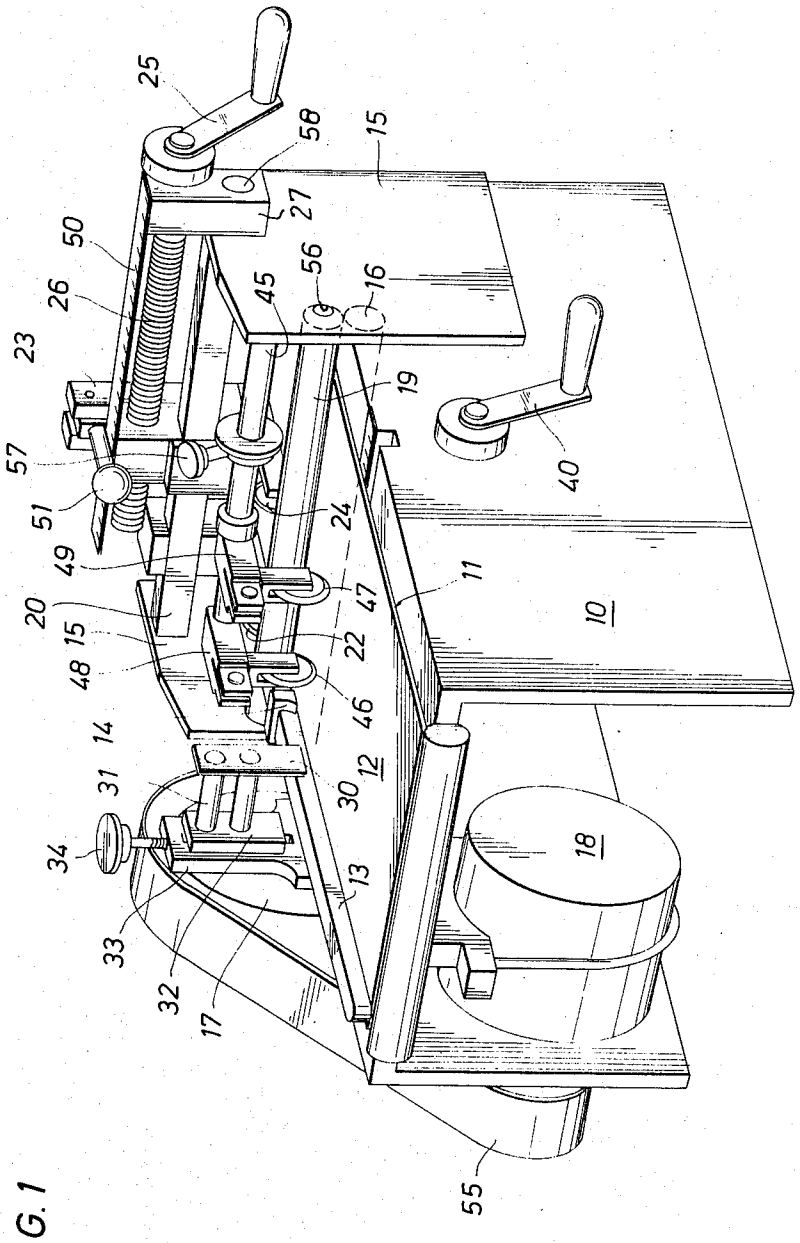

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FIG. 1

FIG. 2

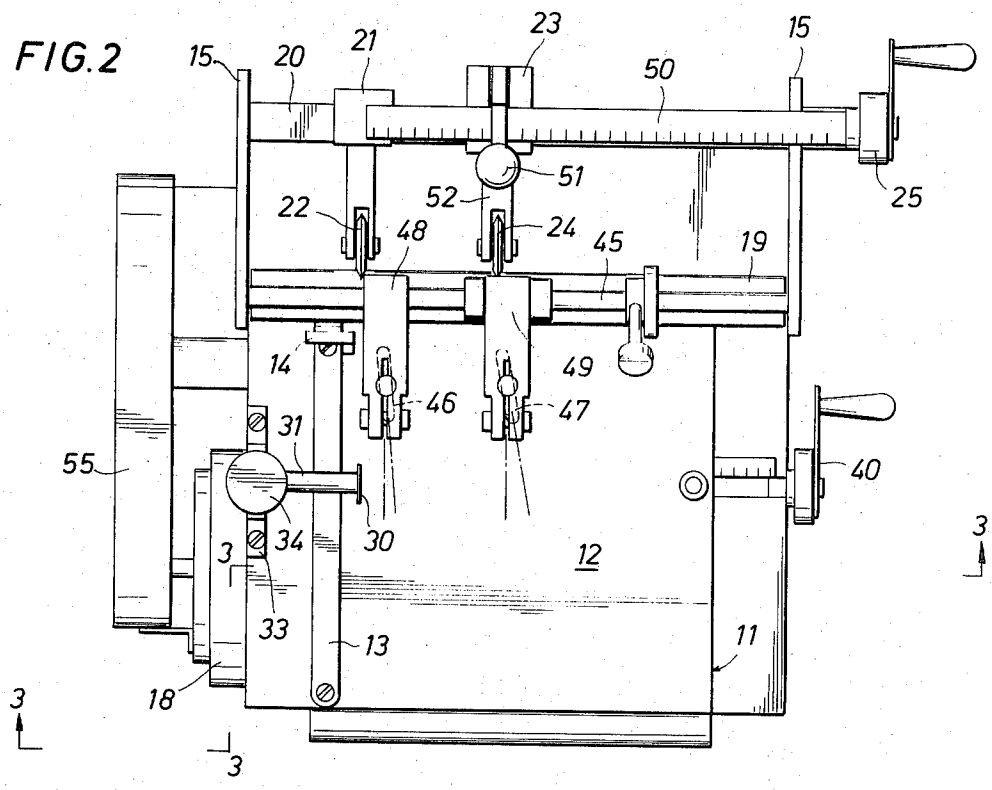
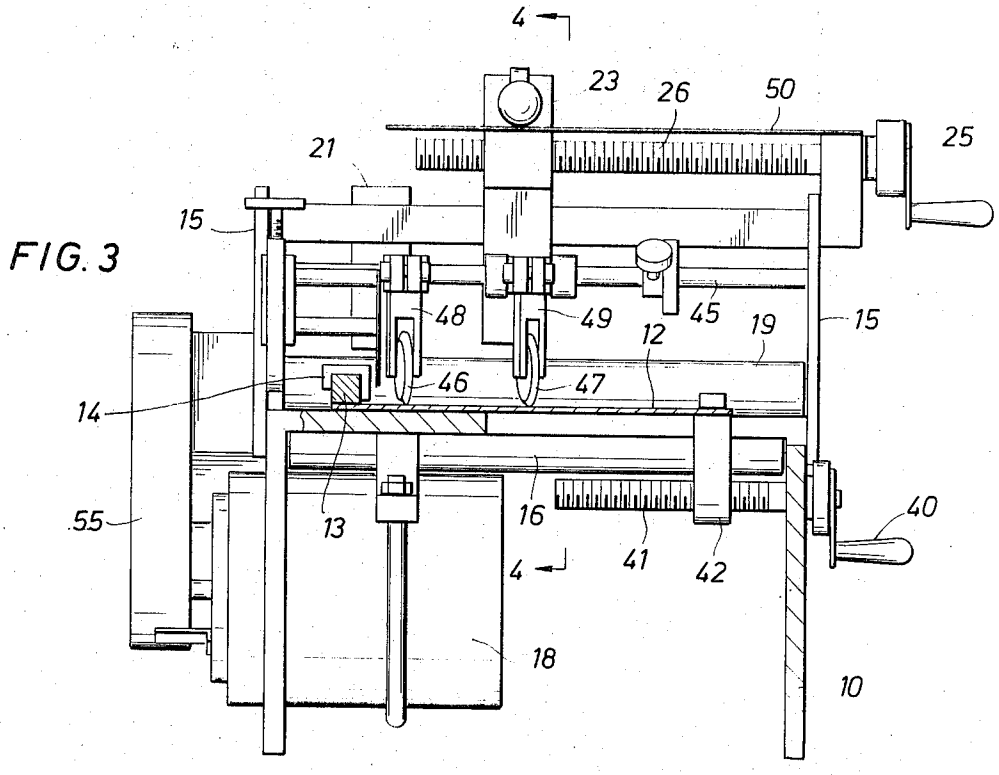

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FIG. 3


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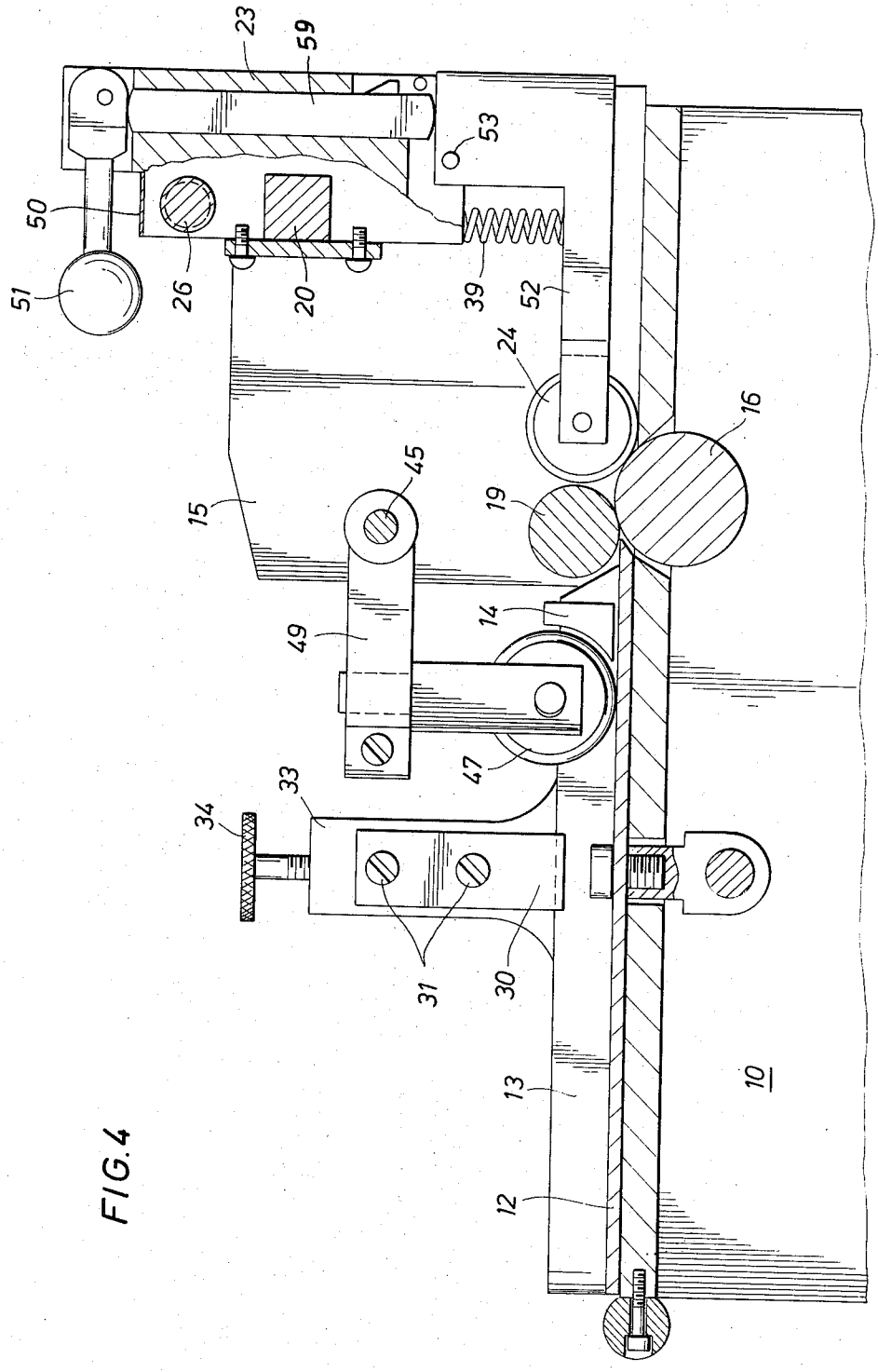


FIG. 4

PAPER TRIMMING MACHINE

BACKGROUND OF THE INVENTION

a. Field of the Invention

Apparatus for trimming paper workpieces.

b. Description of the Prior Art

Many types of paper trimming devices are known in the art. With the advent of photographic or photosensitive typesetting procedures in the printing industry, the need for a particularly accurate paper trimming device to properly trim headlines, columnar fonts of type, advertising display lines and the like became apparent. Devices are presently known in the paper cutting art which perform similar functions, but certain problems have been experienced with the prior art devices. Exemplary of the state of the art are U.S. Pat. Nos. 246,923; 1,730,196; 2,000,175; 2,360,653; 3,241,415 and British Patent 23,952.

Problems have arisen with devices in the prior art centering around the accuracy and speed needed for certain paper trimming applications. For example, when headline or columnar fonts of type are to be cut and mounted for printing a newspaper or similar material, the individual columns must be cut extremely accurately. The guides and alignment features of the prior art have proven to be unsatisfactory and too time-consuming for use in a printing establishment which must obtain high speed with accuracy from its paper trimming devices.

SUMMARY OF THE INVENTION

The invention resides in the rapid and accurate trimming made possible by the combination of a base roller, severing means adjacent said base roller, means for aligning and holding the workpiece laterally with respect to the severing means, and means contacting the base roller for advancing the workpiece past the severing means.

In certain embodiments, the holding means take the form of a laterally adjustable workpiece support and angularly mounted rotatable guides for biasing the workpiece against the support.

The invention accomplishes accurate trimming of paper items with substantially increased speed as compared to prior art devices and processes.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawings show the inventor's presently preferred embodiment of the invention. In the drawings:

FIG. 1 is a perspective view partially in relief of the inventor's presently preferred embodiment of the invention.

FIG. 2 is a top plan view of the apparatus as shown in FIG. 1, showing the positional relation of the workpiece support, and the workpiece alignment means to the cutters.

FIG. 3 is a generally front elevation view of the apparatus as shown in FIG. 1.

FIG. 4 is a schematic view in side elevation and partial section showing the relationship of the base roller, cutter discs, idler roller and workpiece support.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The inventor's presently preferred embodiment of the invention is shown in FIG. 1. The apparatus in-

cludes a base 10 and a laterally adjustable work piece support generally designated by the numeral 11. Workpiece support 11 includes the laterally adjustable table 12, along one side of which is mounted a generally elongated lateral guide 13. Lateral guide 13 also includes mounted thereon a hold down guide 14 under which a workpiece (not shown) passes immediately before the severing operation takes place.

Attached to base 10 are a pair of generally vertical standards 15, which support the cutting and advancing means of the apparatus. Mounted for driven rotation within base 10 is a base roller 16 (shown in FIG. 1 in relief) which is driven by a pulley 17 and associated gears (not shown). Pulley 17 is connected by way of a flexible belt (not shown) or the like to a motor 18, which is covered by a belt cover 55.

Resting upon base roller 16 is a feeder roller 19, which forms a line of contact parallel to the axes of base roller 16 and feeder roller 19. Feeder roller 19 is journaled for rotation in vertically elongated apertures 56 and the line of contact of feeder roller 19 with base roller 16 is maintained by the weight of feeder roller 19. Base roller 16 and feeder roller 19 cooperate to advance the workpiece past the cutters 22, 24.

Standards 15 rigidly support a cutter bar 20 therebetween. Mounted on cutter bar 20 is a fixed cutter support 21, which supports a rotatable fixed cutter 22 therefrom. Also mounted on cutter bar 20 is a laterally adjustable cutter support 23 which supports the adjustable cutter 24. Fixed cutter 22 and adjustable cutter 24 are biased into contact with base roller 16, as is shown more clearly in FIG. 4, by compression springs 39. Cutters 22, 24 also may be adjusted by an extension screw and lock nut (not shown) of the type easily obtainable from Cowan Pressroom Products Company, Hollywood, California. Fixed cutter support 21 is mounted on cutter bar 20 by Allen screws or the like (not shown), whereas laterally adjustable cutter support 23 is mounted slidably on cutter bar 20. Adjustable cutter support 23 is moved laterally by manipulation of adjustable cutter bar crank 25, which is mounted on crank support 27 and attached to the threaded cutter adjustment rod 26. Adjustable cutter support 23 is similarly threaded with female threads to receive cutter adjustment 26 therein. By rotating cutter adjustment rod 26 by means of cutter bar crank 25, laterally adjustable cutter 24 may be moved into position to cut the right-hand margin of a workpiece. The position of cutter bar 20 may be secured by a lock nut 58 or the like.

Means for aligning a workpiece with fixed cutter 22 includes indicator 30 mounted on base 10. Indicator 30 is supported by rods 31, which are, in turn, joined to slide 32 which is mounted to slide vertically within an upright 33. When it is desired to align a workpiece with fixed cutter 22, a depressor 34 attached to indicator 30 is depressed and indicator 30 descends to workpiece table 12. If workpiece support 11 needs to be adjusted laterally, the table crank 40 (FIGS. 1 and 3) may be turned, thereby turning the threaded rod 41, on which is mounted connector 42 and table 12. As crank 40 is turned, table 12 moves laterally of base 10 in order to align the workpiece with indicator 30 and one or both of cutters 22, 24.

Also suspended between standards 15 is a guide support bar 45. Guide support bar 45 supports a first guide wheel 46 and a second guide wheel 47. First guide wheel 46 assists in supporting the first guide wheel car-

riage 48 in cooperation with guide support bar 45. Similarly, second guide wheel 47 supports guide wheel carriage 49 in cooperation with guide support bar 45. First guide wheel 46 is located nearest guide 13 and assists in holding aligned and feeding narrow workpieces, such as 35 millimeter columnar strips of phototype between base roller 16 and feeder roller 19. First guide wheel 46 and second guide wheel 47 cooperate in holding a wider workpiece against table 12 and against guide 13 thereby assisting in maintaining proper alignment as the workpiece is fed between base roller 16 and feeder roller 19. First and second guide wheels 46, 47 are canted slightly (FIGS. 2 and 3) to frictionally urge a workpiece gently toward guide 13 as the workpiece passes toward and through base roller 16 and feeder roller 19. First guide wheel 46 is canted from a line parallel to guide 13 at an angle of, for example, about two to three degrees. Guide wheel 47 is canted at a slightly greater angle such as 10 degrees from parallel to guide 13. First guide wheel 46 is canted at a lesser angle from parallel because of the substantially lighter stock usually encountered with 35 millimeter phototype material. Any greater angle than that set out above would tend to bend or "cup" the lighter stock material and not feed the material flat to feeder roller 19. It is to be understood that the weight of first guide wheel carriage 48 and second guide wheel carriage 49 bear on guide wheels 46, 47 to assist in the proper frictional engagement with the workpiece in order to keep the workpiece flat against adjustable table 12. The weight of the carriages may be adjusted slightly for different thicknesses of stock of the workpieces. The frictional force which urges the workpiece against guide 13 can be altered by changing the weight of carriages 48, 49, as well as changing the angle at which guide wheels 46, 47 are canted from parallel to guide 13. To aid guide wheels 46, 47 in frictionally engaging the workpiece, the rims of the wheels are covered with a resilient material such as neoprene, or the like. Guide wheels 46, 47 may be raised from table 12 by rotation of guide support bar 45 by means of lever 57. Guide wheel carriages 48, 49 are independently mounted on guide support bar 45 and each may "ride" over different thicknesses of a workpiece passing under each wheel.

In operation, a workpiece is placed on table 12, is aligned with indicator 30 to remove the left-hand margin excess with fixed cutter 22. Guide 13 and table 12 may be adjusted laterally by crank 40, should any adjustment be necessary. In order to cut the excess from both margins of a workpiece, adjustable cutter 24 is adjusted laterally by crank 25 to properly align cutter 24 with the right-hand margin of the workpiece. A ruler 50 indicates the position of adjustable cutter 24 relative to the workpiece. Adjustable cutter 24 is raised prior to lateral adjustment by moving the lever 51 to vertical position, thereby moving bar 59 downwardly and causing pivoted cutter support 52 to pivot about pin 53 to lift adjustable cutter 24 from contact with base roller 16.

The workpiece is then manually advanced to feeder roller 19 and an actuator, such as a foot pedal, actuates motor 18 which drives base roller 16, feeder roller 19 and cutters 22, 24. Feeder roller 19 and cutters 22, 24 are driven by contact with base roller 16. Therefore, uniform linear speed between base roller 16, feeder roller 19 and cutters 22, 24 is achieved. Once the workpiece is fed between feeder roller 19 and base roller 16, motor 18 is actuated and the workpiece is advanced by cooperation of base roller 16 and feeder roller 19 impinging by its own weight thereon. As the workpiece progresses through base roller 16 and feeder roller 19, guide wheels 46, 47 hold the workpiece flat against table 12 and urge the workpiece laterally against guide 13. The workpiece then passes through hold down guide 14 to eliminate any possible end flap or tendency of the workpiece to climb up the vertical side of guide 13.

The holding means and placement of feeder roller 19 and cutters 24 contribute to safety of the device for an operator. The hands of the operator do not get near cutters 22, 24, and therefore such accidents are avoided.

Thus it can be seen that an accurate and efficient apparatus for trimming a paper article has been shown. Further modifications and alternative embodiments of the apparatus of the invention will be apparent to those skilled in the art in view of this description. Accordingly, this description is to be construed as illustrative only and is for the purpose of teaching those skilled in the art the manner of carrying out the invention. It is to be understood that the form of the invention herewith shown and described is to be taken as the presently preferred embodiment. Various changes may be made in the shape, size and arrangement of parts. For example, equivalent elements or materials may be substituted for those illustrated and described herein, parts may be reversed, and certain features of the invention may be utilized independently of the use of other features, all as would be apparent to one skilled in the art after having had the benefit of this description of the invention.

I claim:

1. In apparatus for trimming a paper article, the combination comprising:
- a base;
- a base roller mounted on said base;
- means for severing a work piece mounted on said base adjacent said roller;
- means for holding said work piece flat and aligned laterally with respect to said severing means, which holding means includes:
  - a laterally adjustable work piece support;
  - and, means for rotatably biasing said work piece against said work piece support;
- means for indicating the lateral position of said severing means relative to said holding means;
- and means contacting said base roller for advancing said work piece past said severing means.

2. In apparatus for trimming a paper article, the combination comprising:
- a base;
- a base roller mounted on said base;
- means for severing a work piece mounted on said base adjacent said roller;
- means for holding said work piece flat and aligned laterally with respect to said severing means, which holding means includes a laterally adjustable work piece support and means for rotatably biasing said work piece vertically and laterally against said work piece support;
- and, means contacting said base roller for advancing said work piece past said severing means.

3. In apparatus for trimming a paper article, the combination comprising:

a base;
a base roller mounted on said base;
a cutter disc contacting said base roller having an axis of rotation substantially parallel to the axis of said base roller;
means forming a line of contact with said base roller for advancing a workpiece between said base roller and said cutter discs;
and, means for laterally aligning a workpiece relative to said cutter disc, including:
an indicator mounted on said base aligned with said cutter disc;
a laterally adjustable workpiece support;
and, means for rotatably biasing said workpiece against said support.

4. The invention as claimed in claim **3,** wherein said biasing means includes:
a wheel frictionally biasing said workpiece downwardly and laterally against said support.

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