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H. NEUWIRTH

2,219,485

CUTTING APPARATUS

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Fig. 1.

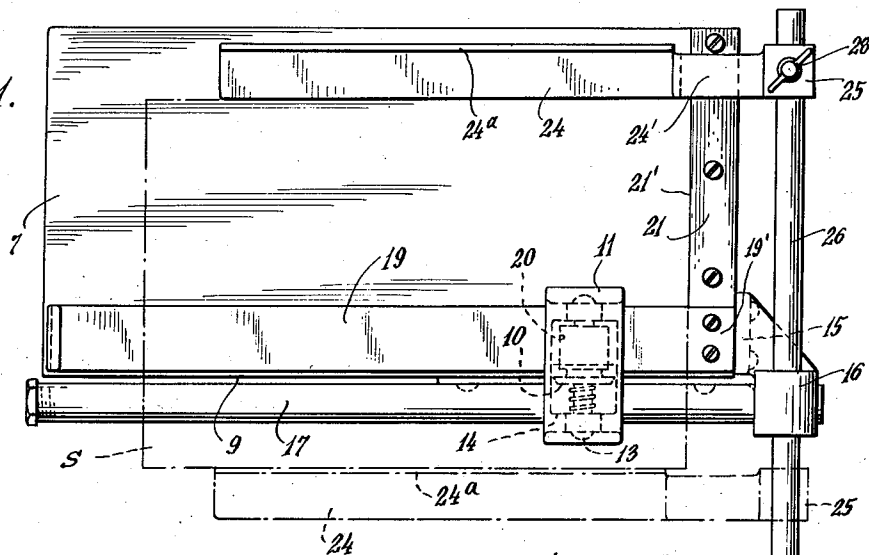


Fig. 2.

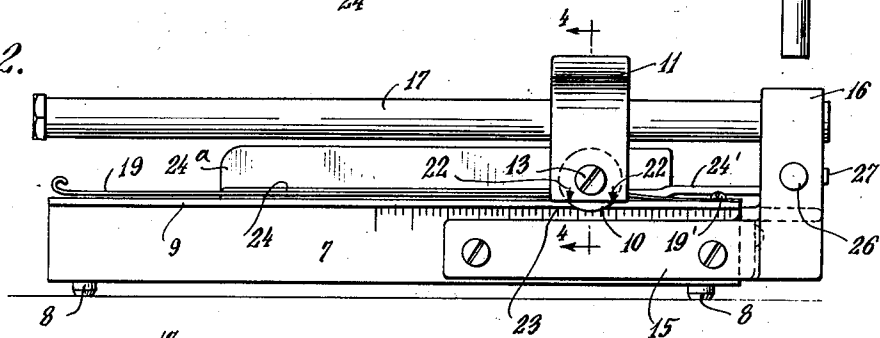


Fig. 3.

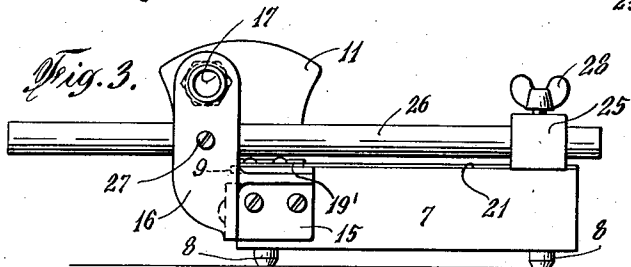


Fig. 5.

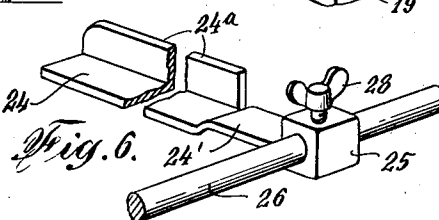
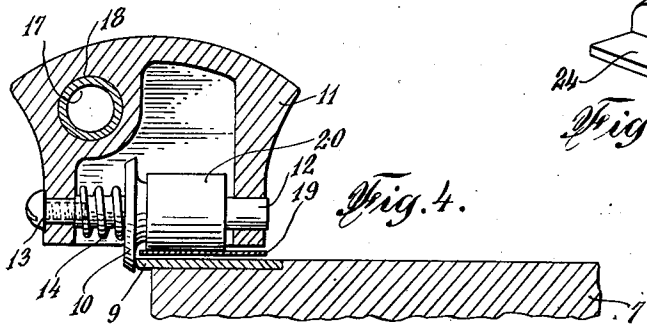
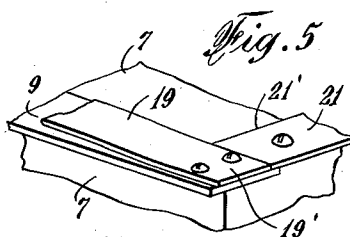


Fig. 6.

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CUTTING APPARATUS

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6 Claims. (Cl. 164—77)

This invention relates to apparatus for cutting and slitting sheets or webs, such as paper, cardboard and the like, and while it is adapted for use for various purposes it is particularly adapted for trimming photographic prints preparatory to mounting the same upon a support.

It is an object of the invention to provide an improved sheet or web cutting and slitting apparatus of this character including a support for the sheet or web to be cut arranged with a straight edge, and a cutter mounted on the support to have movement parallelly of and co-operate with the straight edge to effect cutting of the sheet or web.

Another object of the invention is to provide in sheet or web cutting and slitting apparatus of this character, a support for the sheet or web arranged with a straight edge, a rotary cutter, a carrier for the cutter supported to have movement longitudinally of the straight edge and arranged to position the cutter with a side of a peripheral portion disposed relative to the straight edge and effect a shearing cut of the sheet or web, and the provision of means to clamp the sheet or web to the support therefor including a flexible member fixed at one end upon said support and extending parallelly of the straight edge and between which flexible member and the support the sheet or web to be cut is adapted to be engaged, and a roller arranged coaxially of and rotatable with the cutter adapted to have rolling engagement with said flexible member by the movement of the cutter carrier and thereby clamp the sheet or web to the support and impart rotary movement to the cutter.

It is a further object of the invention to provide in cutting and slitting apparatus of this character a gauge for a side edge of the web or sheet to be cut, and an adjustable gauge for engagement and to gauge a sheet at the leading or following edge to determine the width of the portion to be severed from the sheet or web.

Other objects of the invention will hereinafter appear.

In the drawing accompanying and forming a part of this application,

Figure 1 is a plan view of my improved sheet or web cutting and slitting apparatus.

Figure 2 is a front elevation looking at the bottom of Figure 1.

Figure 3 is a side elevation looking at the right of Figure 2.

Figure 4 is a cross sectional view on an enlarged scale taken on the line 4—4 of Figure 2 and looking in the direction of the arrows.

Figure 5 is a detail view in perspective to show the mounting of the clamping member to clamp the sheet or web on the support relative to the straight edge and the arrangement of a gauge for a side edge of a sheet or web on the support; and

Figure 6 is a perspective view of a gauge for the leading or following edge of the sheet and showing the means for adjustably mounting the same upon a support therefor.

In carrying out the embodiment of the invention illustrated in the drawing there is provided a support for the sheet or web S to be cut or slitted, and shown in the form of a baseboard 7 of rectangular shape of suitable material, preferably wood, said board having feet 8 fixed to one face adjacent the corners to support the board in horizontal position. The sheet supporting board is provided with a member 9 having a straight edge extending parallelly of a longitudinal side of the board and comprises a steel plate secured, as by screws, in a recess in the top of the board with the upper surface thereof flush with the top of the the board and the longitudinal edge portion arranged with the straight edge projecting from the side of the board, said edge being beveled to incline rearwardly from the top surface to the bottom surface of the plate to constitute a cutting edge, as clearly shown in Figure 4.

A sheet or web to be slitted or cut is placed upon the board with a marginal portion thereof of a width to be slitted or cut from the sheet projecting beyond the straight edge and the sheet is cut by a cutter movable longitudinally of and co-operating with the straight edge. As shown, the cutter 10 is of circular form the peripheral edge of which is arranged as a beveled cutting edge and is rotatably mounted in a carrier 11 therefor. The carrier is in the form of a hood or shield, the cutter being rotatably mounted within said hood with a peripheral portion projecting therefrom by loosely mounting the cutter upon a stud 12 extended transversely of and mounted at the ends in opposite walls of the hood, one end of the stud being reduced in diameter and engaged in an opening of corresponding diameter in one wall of the hood with the shoulder formed by the portion of reduced diameter abutting the inner surface of said hood wall and secured therein against axial movement by a screw threaded into said portion of reduced diameter with the screw head abutting the outer surface of said hood wall, as shown at 13 in Figure 4. The cutter is urged in one direction axially on the stud by a spring 14 coiled about the stud and interposed between the

cutter and wall of the hood in which the stud is secured.

The cutter carrier is mounted to have movement with the cutter longitudinally of the straight edge. For this purpose a bracket 15 is mounted on the board at the corner formed at the juncture of an end thereof and the side relative to which the straight edge extends, as shown at the right in Figures 1 and 2, said bracket having an upwardly extending arm 16 offset laterally from the end of the board and forwardly of the side from which the straight edge projects. A rail 17 in the form of a circular tube is supported at one end on said bracket arm 16 and extends parallelly of the straight edge in a plane above and slightly forward of the straight edge and is of a length substantially equal to the length of the sheet supporting board. The cutter carrier is slidably mounted upon the rail 17 by engaging the rail in an opening 18 extended longitudinally through the cutter carrier at one side of the center thereof, said opening being arranged above and extending in a direction transversely of the cutter carrying stud 12 at the outer side of the cutter, as shown in Figure 1. By mounting the rail 17 in the bracket arm 16 to extend parallelly of and in a plane above and forwardly of the straight edge and mounting of the cutter carrier on the rail, the cutter is disposed with a peripheral portion and the cutting edge intersecting the straight edge, and the cutter is yieldingly urged into engagement with the straight edge by the spring 14.

To maintain the sheet in cutting position on the board to assure cutting a strip of uniform width from a sheet and also effect efficient cutting of the sheet, the sheet is held in flat condition on the straight edge member by a resilient metal strip 19 secured at one end upon the board at the corner at which the bracket 15 is mounted, as at 19', with the free end extending in superposed and parallel relation to the straight edge member and disposed rearwardly of the straight edge thereof as shown in Figure 4, the sheet to be cut being engaged between said strip 19 and the straight edge member. A roller 20 is arranged on the cutter supporting stud 12 coaxially of and at the side of the cutter opposite the side engaged by the spring 14 and is connected to the cutter to rotate therewith. The roller is in the nature of a traction roller having rolling engagement with the resilient strip and is adapted to clamp the sheet or web between said strip and the straight edge member adjacent the point at which the cutting edge of the cutter crosses the straight edge as the cutter is rotated and is moved longitudinally of the straight edge the engagement of said roller with said strip imparting rotative movement thereto which is transmitted to rotary movement of the cutter.

To gauge a sheet or web on the sheet support relative to the straight edge a plate 21 is fixed upon the top of the sheet supporting board at the end at which the resilient strip 19 is secured to extend transversely of the board at a right angle to the straight edge 9, the inner edge 21' of said plate serving as a straight edge for engagement of a side edge of the sheet or web.

In operation the sheet to be cut or slitted is engaged upon the table below the resilient plate 19 with the side edge of the sheet abutting the straight edge 21' of the plate 21, the sheet being positioned with a portion thereof of a width desired to be cut therefrom projecting from the

straight edge 9, the cutter being positioned in abutting relation to the bracket arm 16 with the roller 20 engaging the end portion of the resilient strip 19 at which it is secured upon the sheet supporting board. After the sheet has been positioned below the resilient member 19 the cutter carrier is moved outward on the rail 17, pressure being applied to the cutter carrier to cause the roller to firmly engage the resilient strip, which is permissible since the cutter carrier is adapted to have rotative movement on its supporting rail, the roller clamping the sheet between said resilient plate and the straight edge member at and adjacent the point where the cutting edge of the cutter crosses the cutting edge of the straight edge member, the cutter being yieldingly though firmly pressed against the cutting edge of the straight edge by the spring 14 and thereby assuring a smooth shearing cut of the sheet. It will be obvious that by arranging the cutter carrier as a hood for the cutter there is no possibility of injury to the hand in manipulating the cutter carrier. Instead of cutting a portion from the sheet it may be desired to only slit the sheet for a predetermined width of the same and slit the sheet inwardly from either side edge thereof. For this purpose the cutter carrier is provided with arrows 22 at opposite sides of the center thereof and at the points at which the cutting edge of the cutter intersects the straight edge 9, as shown in Figure 2, and the edge of the sheet supporting board may be provided with graduations, as indicated at 23, with which the arrows 22 co-operate to indicate the extent of movement of the cutter carrier and thereby the length of the slit. Should it be desired to slit the sheet inwardly from the right hand edge as viewed in Figures 1 and 2, the cutter carrier is positioned in abutting relation to the bracket arm 16 at the commencement of cutting the sheet, and should it be desired to slit the sheet inwardly from the opposite side edge the cutter carrier is positioned outwardly on its supporting rail 17 and during the cutting operation is moved on the rail toward the rail supporting bracket arm 16, the length of the slit being determined as indicated by the position of the arrow at the right of the axis of the cutter relative to the graduations 23 on the edge of the cutting board.

To cut successive sheets to predetermined size, or to sever successive strips of predetermined and the same width from the sheet a gauge is provided to gauge the leading or following edge of the sheet. As shown in Figures 1, 2 and 6, this gauge comprises a member 24 of right angle shape in cross section having one angle portion removed at one end and offset laterally, as at 24', whereby it is connected to a block 25 having an opening therein for the slidable engagement of a bar 26 and by means of which bar the gauge is mounted upon the sheet supporting board to extend parallelly of the straight edge 9 forwardly or rearwardly thereof and to have adjustment toward and away from the straight edge. For this purpose the bar 26 is mounted in an opening in the bracket arm 16 with the ends projecting from opposite sides of the bracket arm at right angles to the cutter carrier supporting rail 17 and secured therein by a set screw 27. As shown in Figure 1, the gauge 24 is mounted on the one end of the bar 26 to extend transversely of the top of the sheet supporting board to gauge a sheet at the following edge with the one angle portion of the gauge extending sub-

stantially in the plane of and contiguous to the top of the sheet supporting board due to the offsetting of the gauge, as at 24', and the other angle portion 24a of the gauge extending perpendicular to the top of the sheet supporting board and parallelly of the straight edge 9. The gauge is adjustable longitudinally on the bar 26 toward and away from the straight edge 9 whereby to gauge sheets on the board relative to the straight edge and trim successive sheets to predetermined width or length. The gauge is secured in adjusted position on the bar 26 by a thumb screw 28. To gauge a sheet on the sheet supporting board at the leading edge to sever successive strips of predetermined and the same width from a sheet, the gauge 24 is mounted on the end of the bar 26 projecting forwardly of the straight edge 9 with the perpendicular portion 24a of the gauge in opposed parallel relation to the straight edge, as shown in dot and dash lines in Figure 1.

It will be obvious that various modifications may be made in the construction and arrangement of the parts in the embodiment of the invention illustrated without departing from the scope of the invention.

Having described my invention, I claim:

1. In cutting apparatus, a horizontal sheet support, a straight edge mounted on said support, a circular cutter, a carrier rotatably supporting the cutter, a support extending parallelly of and in spaced relation to the straight edge upon which the cutter carrier is mounted to have movement longitudinally of the straight edge and toward and away from the sheet support and arranged to position the cutter with a side thereof engaging and a peripheral portion of the cutting edge intersecting the straight edge, a clamping member mounted upon the sheet support to extend parallelly of the straight edge and have movement toward and away from the sheet support and below which member the sheet upon the sheet support to be cut is adapted to be engaged and a roller rotatable with the cutter adapted to be engaged by the carrier with and move the clamping member to clamp a sheet to the sheet support and have rolling engagement with said clamping member by the movement of the cutter carrier on its support longitudinally of the straight edge and rotate the roller and cutter.

2. In cutting apparatus, a horizontal sheet support, a straight edge fixed on said support, a strip of resilient material fixed at one end upon the support above and extending parallelly of the straight edge and between which strip and straight edge a sheet upon the sheet support is adapted to be engaged, a circular cutter, a carrier for the cutter, means to mount the cutter on the carrier to have rotary and axial movement, a support extending parallelly of and in a plane above the straight edge upon which the cutter carrier is mounted to have movement longitudinally of the straight edge and said carrier and support arranged to position the cutter with a peripheral portion juxtaposed to and the cutting edge intersecting the straight edge, a spring yieldingly urging the cutter axially toward and into engagement with the straight edge, a roller rotatable with the cutter positioned in engagement with the resilient strip by the cutter carrier to clamp the sheet to the sheet support as it is cut, and said roller by the movement of the cutter

carrier on its support adapted to have rolling movement on the strip relative to the sheet support and rotate the cutter and the cutter cooperating with the straight edge to cut the sheet.

3. In cutting apparatus, a rectangular sheet supporting board adapted to be supported in horizontal position and arranged with a straight edge extending along an edge of the board, a flat member of resilient material fixed at one end on the board to extend parallelly of the straight edge above the board and below which the sheet to be cut is adapted to be engaged, a bracket fixed to the board at the end of said member at which it is fixed on the board, a rail mounted at one end in said bracket extending parallelly of and in a plane above the straight edge, a circular cutter, a carrier rotatably supporting the cutter mounted on said rail to have movement thereon longitudinally of the straight edge positioning the cutter with the cutting edge intersecting the straight edge, and a roller rotatable with the cutter positioned by the cutter carrier in rolling engagement with the member of yielding material to clamp the sheet below said member to the board and rotate the cutter as the roller and cutter are moved relative to the straight edge with the cutter carrier and a straight edge to gauge a sheet at the side edge upon the board fixed upon the board at the end of the resilient member and extending transversely of the board at a right angle to the straight edge.

4. In cutting apparatus, a rectangular sheet supporting board adapted to be supported in horizontal position and arranged with a straight edge, a strip of yielding material fixed at one end upon the board above and extending parallelly of the straight edge and between which strip and straight edge a sheet to be cut is adapted to be engaged, a bracket fixed to the board at the end of said strip at which it is fixed to the board having a portion extending upwardly and forwardly of the straight edge, a rail fixed at one end in said upwardly extending portion of the bracket extending parallelly of the straight edge, a circular cutter, a carrier for the cutter mounted on the rail to have movement thereon longitudinally of the straight edge, means to mount the cutter on the carrier to have rotary and axial movements and position the cutter with a peripheral portion intersecting the straight edge, means to yieldingly urge the cutter toward the straight edge, a roller arranged axially of and rotatable with the cutter adapted to engage the resilient strip and clamp the sheet to the board and adapted by the movement of the cutter carrier on the rail to have rotative movement and transmit the rotation thereof to rotary movement of the cutter relative to the straight edge.

5. In cutting apparatus as claimed in claim 3, a gauge for the leading or following edge of the sheet, and means to adjustably mount said gauge upon the board to extend parallelly of the straight edge forwardly or rearwardly thereof.

6. In cutting apparatus as claimed in claim 3, a gauge for the leading or following edge of the sheet, a bar mounted on the bracket to extend at a right angle to the rail and projecting from opposite sides of the bracket, and means to adjustably mount said gauge upon said bar at either side of the bracket to extend parallelly of the straight edge forwardly or rearwardly thereof.

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