July 1, 1952 W. VESTORSKY 2,601,898

FILM TRIMMING MACHINE

Filed May 26, 1949 2 SHEETS—SHEET 1

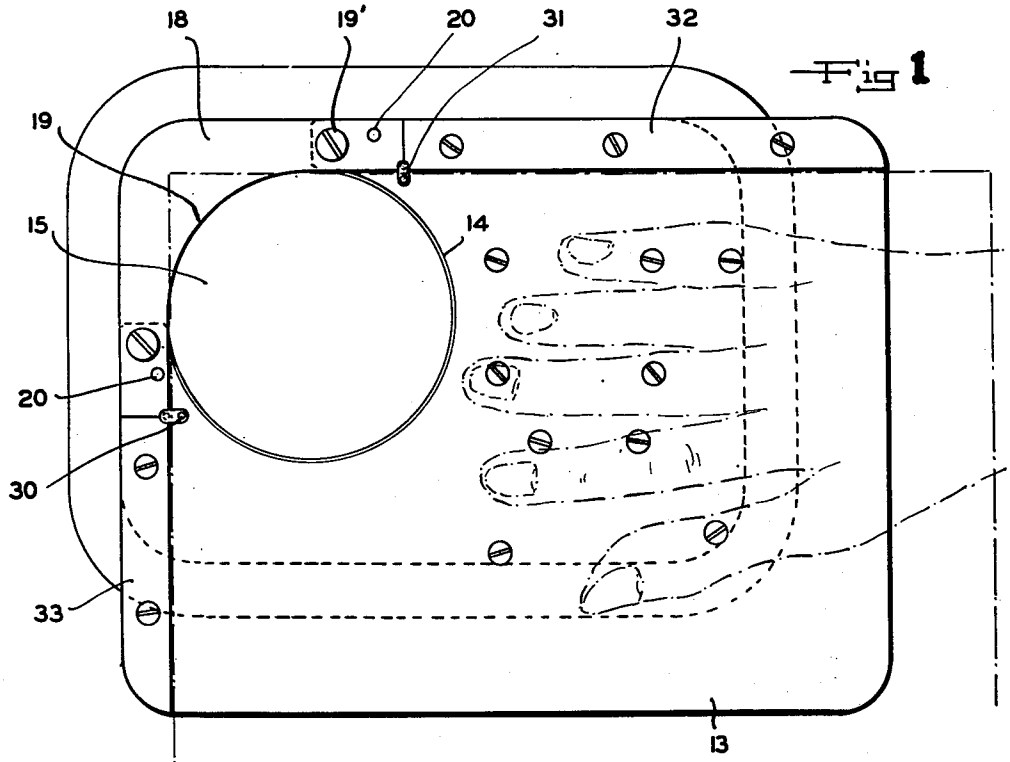


Fig 1

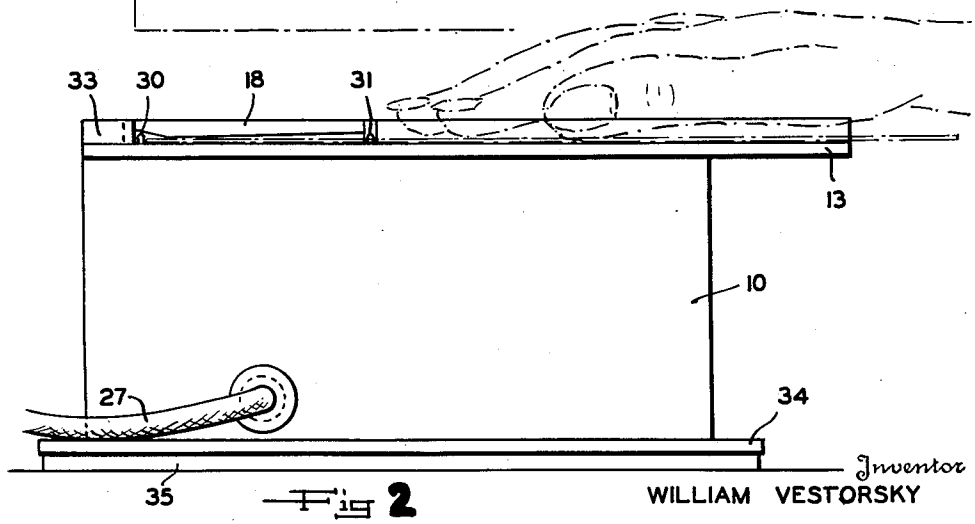


Fig 2

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July 1, 1952 W. VESTORSKY 2,601,898

FILM TRIMMING MACHINE

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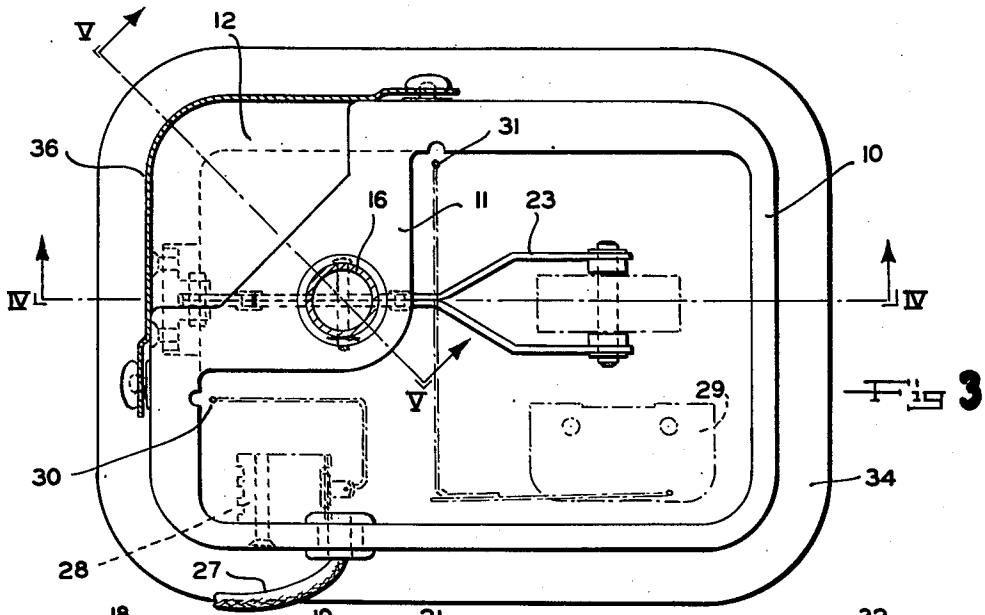


Fig 3

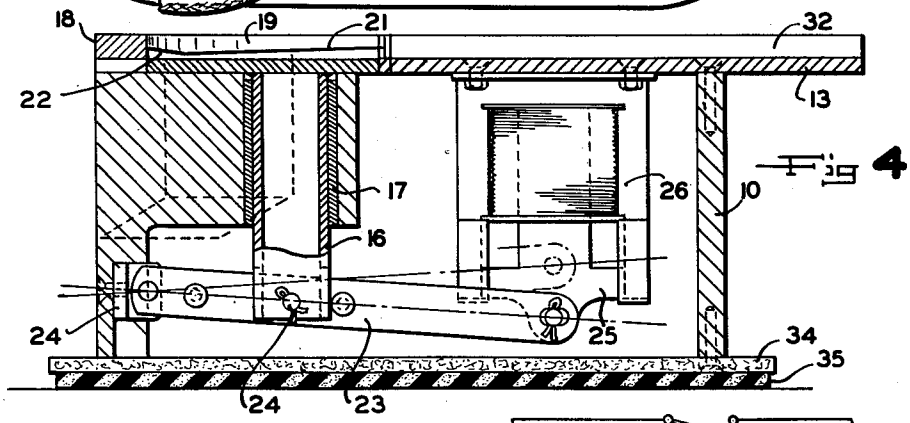


Fig 4

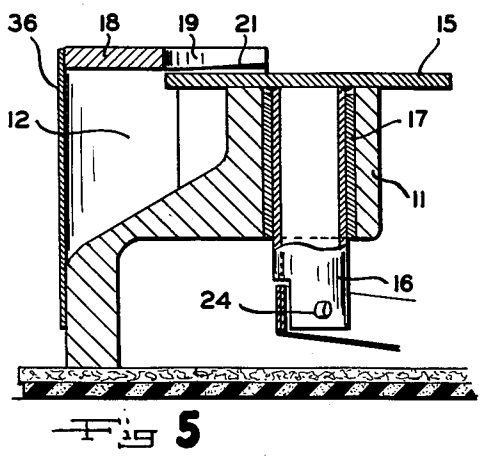


Fig 5

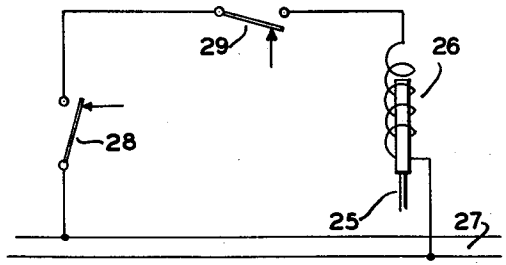


Fig 6

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UNITED STATES PATENT OFFICE

2,601,898

FILM TRIMMING MACHINE

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5 Claims. (Cl. 164—47)

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This invention relates to apparatus for trimming pieces of X-ray film and the like and more particularly to apparatus for clipping off the corners of such pieces to round the same for facilitating the handling and filing of such pieces.

The primary object of the invention is the provision of a unitary assembly for performing the stated operation on pieces of X-ray film and the like which is extremely rugged and simple in design and which is capable of long periods of service without attention or maintenance. This general object of the invention is accomplished by incorporating with a flat plate adapted to receive the X-ray film in flat overlying relation, an improved and simplified shearing die set which is operable upon actuation to sever the corner portion of the film along a curved line.

A further and more specific object of the invention is the provision in apparatus of the character mentioned above of an improved actuating device for the shearing die and of an improved arrangement for controlling the energization of the actuating device whereby the assembly is entirely automatic in operation, being operable to automatically sever a corner of a flat film piece immediately upon proper positioning of the piece in the apparatus.

The above and other objects and advantages of the invention will become apparent upon consideration of the following detailed specification and the accompanying drawing wherein there is disclosed a preferred embodiment of the invention.

In the drawing:

Figures 1 and 2 are plan and side views, respectively, of an improved film trimmer constructed in accordance with the principles of the invention;

Figure 3 is a plan view of the device of Figures 1 and 2 with the top plate, dies and other parts removed;

Figure 4 is a longitudinal section through the apparatus;

Figure 5 is a fragmentary sectional view taken along the line V—V of Figure 3; and

Figure 6 is a schematic wiring diagram of the controlled energizing circuit used in the apparatus.

I provide a shell type of casing 10 which is preferably of cast construction and which is provided with an integral heavy diagonal strut 11 and a corner recess 12 outwardly of the strut 11. The top and bottom surfaces of the casing 10 are flat and parallel and rigidly secured to the top surface thereof is a flat sheet metal plate 13

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which is preferably provided with a polished top surface and with a length and width greater than the dimensions of the casing 10 so that it overhangs one end and one side of the casing as shown in Figures 1, 2 and 4.

One corner of the plate 13 is cut away along a circular path as at 14 to receive a circular disc-like die member 15 which is preferably fabricated of tool steel and provided also with a polished top surface as will be understood. The die member 15 may be slightly thinner than the plate 13 so that the top surface thereof lies in a plane which is below the top plane of the plate 13 so that a corner of a film piece may be readily slid along the top surface of the plate 13 and across the disc-like die member 15.

Concentrically secured to the member 15 and depending therefrom is a round stud 16 slidably received in a bushing 17 held in a bore formed in the strut 11.

I provide a fixed arcuately-shaped die member 18 having only its end portions rigidly secured to the casing 10 as by means of the cap screws 19'. The die member 18 is made of flat stock, as shown, but with thicker end portions as evident upon comparison of Figures 4 and 5 and from inspection of Figure 1 so that the lower surface of the center portion of the die member 18 is spaced upwardly a slight distance from the plane of the top surface of the plate 13 to easily accommodate the thickness of the film being cut. The inner edge 19 of the die member 18 is accurately formed complementarily to the outer periphery of the movable die member 15 so that the members 15 and 18 together form a shearing die set which is operative upon upward movement of the disc 15 to shear off that corner portion of a piece of X-ray film or the like lying on the plate 13 which is projected underneath the fixed die member 18. Since the fixed die member 18 is rigidly secured to the same casting in which the carrier post 16 for the movable die member 15 is guided, the die set is extremely rugged and will maintain its alignment over long periods of service. Suitable dowels 20 are utilized to insure the rigidity of the fixed die member 18 with respect to the casing 10 in a manner well-known in the die making art.

The lower surface of the die member 18 adjacent the cutting edge 19 is ground on a bias as indicated by the lines 21 and 22 in Figures 4 and 5 to provide for "shear" in the die set. In actual practice I prefer to begin the cutting at the center of the arc and to progress the cutting in both directions to the ends thereof.

For actuating the movable die member 15 I provide a forked lever 23 which is pivotally mounted at one end to a pintle block 24 received in a recess formed in the wall of the casing 10. The lower end of the post 16 is slotted to receive a center portion of the lever 23 and a pivot pin 24 is inserted to interconnect the lever 23 and the post 16. The forked end of the lever 23 is loosely connected to a plunger 25 of a solenoid 26 which is rigidly attached to the lower surface of the plate 13. It will be obvious upon inspection of Figure 4 that energization of the solenoid 26 will move the die member 15 upwardly past the cutting edges of the fixed die member 18. Upon de-energization of the solenoid the weight of the plunger or armature thereof as well as the weight of the movable die member and of the lever 23 will return the parts to their initial starting positions as shown.

While I may control the energization of the solenoid 26 by means of a manually engageable switch I prefer to make the machine entirely automatic in operation by providing one or more switches which are operated upon positioning a piece of film to be cut in proper position in the machine. Such switch or switches control the energization of the solenoid 26 from a line cord conductor 27 and by way of example I may provide a small normally open snap acting switch 28 which is rigidly carried by a side wall of the casing 10 and a second similar switch 29 which is secured to and carried by the plate 13. Switch 28 is provided with an operating member 30 which is a bent piece of wire extending upwardly through an elongated aperture formed in the plate 13 and a similar operator 31 is provided for the switch 29. Referring to Figures 1 and 4 it will be noted that I have provided fixed guides 32 and 33 along two of the edges of the plate 13 in general continuation of the thickened end portions of the fixed die member 18. At the points of junction between the member 18 and the guides 32 and 33 the inner edges of these parts are recessed so that the upwardly projecting ends of the operators 30 and 31 can be retracted within the guiding planes provided by the members 32 and 33. The switches and operators therefor are so adjusted that the latter are normally biased toward the center of the machine but upon a piece of film being laid on the plate 13 and moved into the corner die 18 both of the switches will be closed as one edge of the film piece approaches parallelism and contact with the guide 32 while another edge thereof approaches parallelism and contact with the guide 33. Therefore, upon the film piece being properly positioned in the machine the solenoid 26 will be automatically actuated and the corner of the film piece cut off.

As shown in Figures 1 and 2 the switch operators 30 and 31 are positioned quite close to the disc-like die member 15 and project above the common plane of the top surface of the plate 13 and die member 15 but a short distance which is substantially coincident with or less than the depth of shear of the fixed die member 18. The result of this arrangement is that during normal operation of the apparatus the upwardly moving die member 15 raises the corner portion of the film sheet being trimmed above the top ends of the operators 30 and 31, allowing these operators to return to their initial inoperative positions immediately upon completion of the cutting operation. The entire cycle of operation is very abrupt, the duration of energization of the solenoid being kept to a minimum, and of course the switch or switches employed are subjected to a minimum of wear and depreciation. By so limiting the upward projection of the operators 30 and 31 the upper ends of these operators will be positioned well below the upper position reached by the vertically movable disc-like die member 15.

I have also found that satisfactory results may be obtained by utilizing only one switch and operator—the switch 28 and operator 30, for example—since it is more natural for an operator when applying a film piece to the machine to first move it into register with the longer guide 32 and to then slide it to the left into contact with the guide 33. This mode of operation results in equally centered cutting of the corner of the film piece. To complete the assembly of the device I provide a bottom plate 34 which is attached to the casing 10 and to the under-surfact of which is cemented a felt or rubber pad 35. I may also provide a detachable sheet metal cover 36 for enclosing the space 12 in the corner of the casing to provide a compartment for receiving the clippings.

The above specifically described embodiment of the invention should be considered as illustrative only as obviously many changes may be made therein without departing from the spirit or scope of the invention. Reference should therefore be had to the appended claims in determining the scope of the invention.

I claim:

1. In apparatus for trimming the corners of pieces of sheet-like material the combination of a box-like base member having a heavy strut biasing one of its corners, said strut having a vertically disposed bore therein, a flat top plate secured to said base, guide members secured to said top plate and extending along two adjacent sides thereof divergently of said strut, said top plate being cut away at its corner over said heavy strut, a shearing die set comprising a fixed die member secured rigidly to said base in spaced relation above said top plate and a movable die member normally recessed in the cut-away portion of said top plate, said fixed die member having a shearing edge below which an uncut work piece may project and said movable die member having a complementary shearing edge aligned vertically with the shearing edge of the fixed die member and over which said uncut work piece may lie so that upon upward movement of said movable die member a corner portion of said work piece is cut off, a vertically disposed carrier post rigidly mounting said movable die member and positioned in and guided for vertical sliding movement by said bore in said strut, at least one of said die members having a biased shearing edge, a solenoid positioned wholly within said box-like base secured to and depending downwardly from said top plate, lever means pivotally secured at one of its ends to said base and interconnecting the movable armature of said solenoid with the lower end portion of said post, a switch for controlling energy applied to said solenoid, and an operator for said switch extending above the top plane of said plate and positioned adjacent to one of said guide members and adapted to be engaged by an edge of a sheet to close said switch and energize said solenoid.

2. Apparatus according to claim 1 further including a curved plate detachably secured to said base at the corner thereof biased by said strut,

said plate being of such shape as to continue the general outline of the base, thus in cooperation with said strut forming a cavity in said base, said cavity being located below the bottom face of said fixed die member to receive and collect waste trimmings therefrom.

3. In apparatus for trimming the corners of film sheets a box-like base, a flat top plate secured to said base, said top plate having a cut-away corner portion, a rectilinear guide member extending along one side edge of said top plate from the cut-away corner thereof, a vertically movable die member normally positioned in the cut-away portion of the top plate and having a flat upper surface normally positioned in the plane of the flat upper surface of the top plate, a fixed die member rigidly secured to said base and positioned above the plane of the upper surface of the top plate, said fixed die member having a shearing edge below which an uncut work piece may project and said movable die member having a complementary shearing edge aligned vertically with the shearing edge of the fixed die member and over which said uncut work piece may lie so that upon upward movement of said movable die member a corner portion of said work piece is cut off, a carrier post rigidly mounting said movable die and depending downwardly therefrom into said base, means in said base for guiding said carrier post for vertical movement, electro-mechanical means positioned within said base and connected to said post for moving the same vertically, a switch for controlling the application of electrical energy to said electro-mechanical means, and an operator for said switch projecting above the plane of the upper surface of said top plate and positioned adjacent to said die member at an end edge of said top plate and adapted to be engaged by the leading edge of a sheet being advanced longitudinally on said top plate and over said movable die to close said switch.

4. In apparatus for shearing off the corners of flat sheets a box-like base, a flat top plate secured to said base, said top plate having a cut-away corner portion, a rectilinear guide member secured to and extending longitudinally along one side edge of said top plate outwardly of said cut-away corner portion of said top plate, a vertically movable die member normally positioned in said cut-away portion of said top plate and having a flat upper surface normally positioned in the plane of the upper surface of said top plate, a fixed die member rigidly secured in relation to said top plate and spaced upwardly therefrom, said fixed die member having a shearing edge below which an uncut work piece may project and said movable die member having a complementary shearing edge aligned vertically with the shearing edge of the fixed die member and over which said uncut work piece may lie so that upon upward movement of said movable die member a corner portion of said work piece is cut off, cooperating means in said based and on said movable die member for guiding the vertical movement of said movable die member, electro-mechanical means positioned within said base and associated with said movable die member operative in response to the application of electrical energy thereto to cause said movable die to move upwardly, a switch in said base for controlling the application of electrical energy to said electro-mechanical means, and a longitudinally movable operator for closing said switch positioned at an end edge of said plate and adjacent to said die member, said operator extending above the plane of the upper surface of said top plate a distance less than the distance of upward travel of said movable die member and adapted to be engaged by the leading edge of a sheet being slid longitudinally on said top plate, the arrangement being such that said movable die member when moved upwardly will carry said sheet above said operator whereby said operator is released to immediately open said switch and deenergize said electro-mechanical means.

5. In apparatus for trimming sheet-like material having a base and a flat top plate secured to said base; the combination of a guide member secured in fixed relation to said top plate, a fixed shearing die member rigidly secured in spaced relation above said top plate and in predetermined geometrical relation to said guide member, a movable shearing die member normally recessed in said top plate and adapted to be moved upwardly past said fixed die member, said fixed die member having a shearing edge below which an uncut work piece may project and said movable die member having a complementary shearing edge aligned vertically with the shearing edge of the fixed die member and over which said uncut work piece may lie so that upon upward movement of said movable die member a corner portion of said work piece is cut off, electro-mechanical means associated with said movable die member operative in response to the application of electrical energy thereto to cause said movable die to move upwardly, a switch for controlling the application of electrical energy to said electro-mechanical means, and an operator for said switch adjacent to said movable die member and adapted to be engaged by an edge of a sheet to close said switch, said operator extending above said top plate a distance less than the distance of upward travel of said movable die member, the arrangement being such that said movable die member when moved upwardly will carry said sheet above said operator whereby said operator is released to immediately open said switch and deenergize said electro-mechanical means.

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