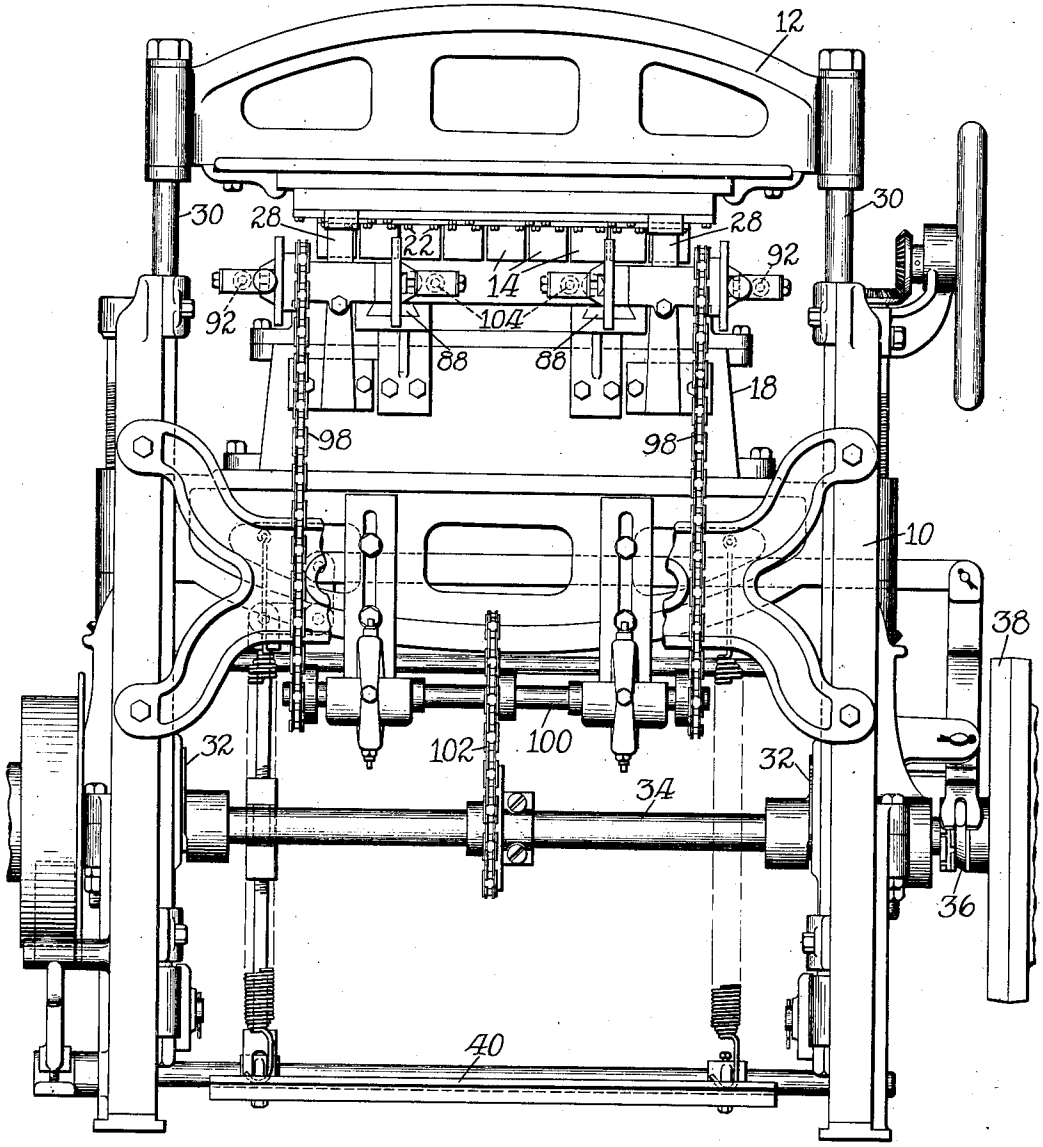
Sept. 12, 1939. W. J. DE WITT 2,172,502

MACHINE FOR OPERATING UPON SHEET MATERIAL

Filed Nov. 27, 1936 3 Sheets-Sheet 1

Fig. 1.



INVENTOR.
William J. De Witt
By his Attorney
Victor Cobb.

Sept. 12, 1939. W. J. DE WITT 2,172,502

MACHINE FOR OPERATING UPON SHEET MATERIAL

Filed Nov. 27, 1936 3 Sheets-Sheet 2

Fig. 6.

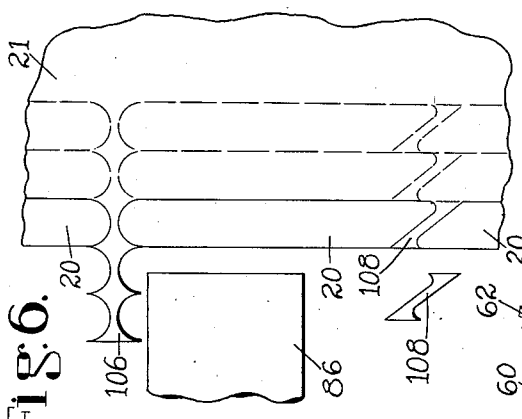


Fig. 2.

INVENTOR.
William J. De Witt
By his Attorney
Victor Cobb.

Sept. 12, 1939. W. J. DE WITT 2,172,502

MACHINE FOR OPERATING UPON SHEET MATERIAL

Filed Nov. 27, 1936 3 Sheets-Sheet 3

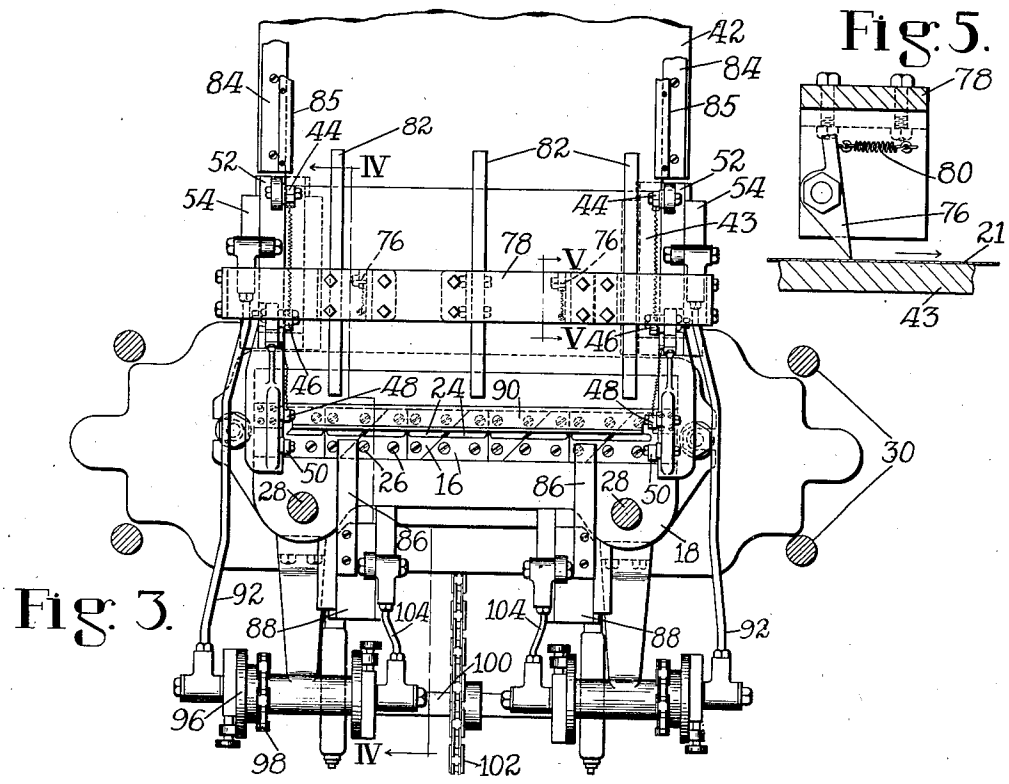


Fig. 3.

Fig. 5.

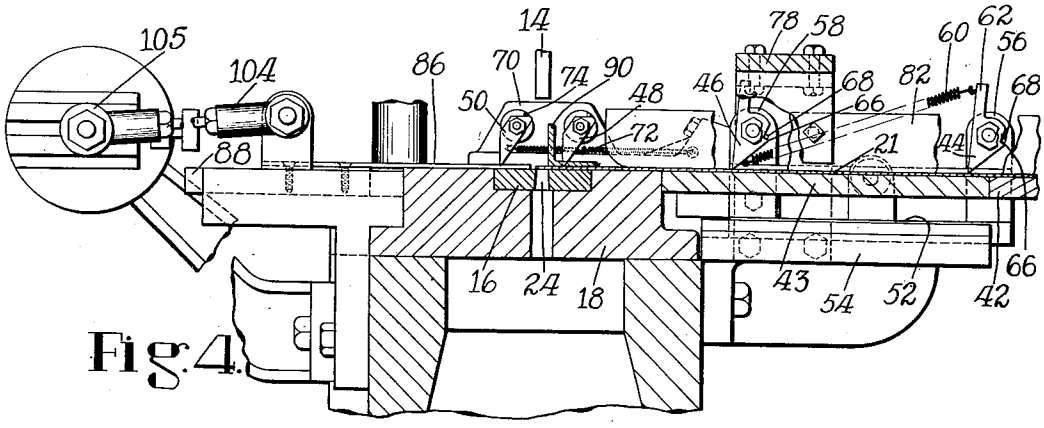


Fig. 4.

INVENTOR.
William J. De Witt
By his Attorney
Victor Colby.

Patented Sept. 12, 1939 2,172,502

UNITED STATES PATENT OFFICE

2,172,502

MACHINE FOR OPERATING UPON SHEET MATERIAL

William J. De Witt, Auburn, N. Y., assignor to Shoe Form Co., Inc., Auburn, N. Y., a corporation of New York

Application November 27, 1936, Serial No. 112,980

8 Claims. (Cl. 164—21)

This invention relates to machines for operating upon sheet material and is herein illustrated as embodied in a machine for producing blanks such as collar stays from material such as sheet pyroxylin.

It is an object of the invention to provide an improved machine of large capacity for producing blanks from sheet material with a minimum of waste of material. To this end, and as illustrated, I have devised a machine of the type referred to in which there are cooperating punches and dies, mechanism for feeding sheet material intermittently past the dies together with gaging devices for alining the leading edge portions of the sheet material with the edges of the dies whereby waste of material between successive blanks died out is avoided.

These and other features of the invention are disclosed in the accompanying drawings, are described in the following detailed specification, and will be pointed out in the claims.

In the drawings:

Fig. 1 is a front elevation of a press embodying one form of my invention;

Fig. 2 is a side view of a portion of the press;

Fig. 3 is a plan view of a portion of the press;

Fig. 4 shows a cross section of the press taken along line IV—IV of Fig. 3;

Fig. 5 shows a cross section of the press taken along line V—V of Fig. 3, showing one of the feed fingers; and

Fig. 6 is a view illustrating the manner in which blanks are cut from the sheet material.

As illustrated in Fig. 1, the machine comprises the frame 10 upon which is mounted for reciprocation a cross head 12 carrying a plurality of punches 14 which are arranged to cooperate with dies 16 (Fig. 3) carried by a bed 18 to produce blanks such as collar stays 20 (Fig. 6) from sheet material 21 of pyroxylin or from other suitable sheet material.

The punches 14 are elongated in shape, are positioned lengthwise in a row transversely across the face of the cross head and are secured thereto by bolts 22. The dies 16 have openings 24 corresponding in shape to the punches 14 and are secured by means of screws 26 to the bed 18 in alinement with the punches. Alinement of the punches and dies during reciprocation of the cross head is maintained by means of guide rods 28 secured to the cross head and extending into openings (not shown) in the bed 18. The cross head 12 is carried by rods 30 slidably mounted in the frame 10 and arranged to be reciprocated by eccentrics 32 mounted upon the ends of a main shaft 34 which is driven through a clutch 36 from a suitable source of power, indicated by the pulley 38 and under control of a treadle 40.

Sheet material 21 is arranged to be advanced over a stock table 42 and a feed table 43, best shown in Figs. 2, 3 and 4, by means of feed fingers or dogs 44, 46, 48 and 50 which are carried by feed slides 52, located upon opposite sides of the table 42, and arranged for reciprocation along the table in guideways 54. The feed dogs 44 are mounted in ears 56 positioned upon the feed slides 52 and have pointed end portions adapted frictionally to engage the stock upon the feed table 43. The feed dogs 46 are similarly mounted upon ears 58 at opposite sides of the slide and are positioned forwardly of the dogs 44 and nearer to the dies. Each pair of feed dogs 44 and 46 at opposite sides of the table is connected by a spring 60 which extends from a lug 62 on the upper side of the dog 44 to a point 64 near the tip of the dog 46. The spring thus tends to rotate the dogs in a counterclockwise direction, as shown in Fig. 2, to force the points of the dogs down upon the work. This construction is such that as the slides 52 are moved toward the dies the dogs frictionally engage the material upon the table and advance it toward and past the dies but when the slide is moved in the opposite direction the dogs will slide across the face of the work without moving it. Each of the dogs is provided with an abutment 66 arranged to engage a pin 68 upon the supporting ear which is operative to limit the pivotal movement of the dog. This operates to prevent the dogs from digging into the sheet material to the extent of damaging it. The dogs 48 and 50 are mounted in extensions 70 of the slides 52 and are forced in a counterclockwise direction by means of springs 72. These dogs are so positioned that in the innermost position of the slides the dogs 50 will be located just beyond the die and the dogs 48 will be located immediately to the rear thereof. This operates to hold the sheet material securely in position near the operating point. The dogs 50 also serve to maintain the marginal portions of the sheet material in position after the central portions have been removed therefrom during the dieing out operation. Pivotal movement of the dogs 48 and 50 is limited by pins 74.

In order to maintain the sheet material in advanced position upon rearward movement of the slides 52, I have provided additional dogs 76 carried by a bridge 78 extending laterally across the stock table. Each of the dogs, one of which is shown in detail in Fig. 5, is similar in shape

to the dogs **44** and **46** and is rotated toward the work by means of a spring **80**. As the sheet material is advanced beneath the dogs **76** the latter will be swung about their pivots in the direction of feed and will not interfere with the forward movement of the material. Upon return movement of the slide **52** the points of the dog **76** will prevent rearward movement of the material.

The bridge **78** carries a plurality of wooden bars **82** extending in the direction of feed of the material and positioned above the feed table **43** by an amount corresponding to the thickness of the work plus a small tolerance. These bars act as guides for the sheet material to maintain it close to the stock table. The rearward portions of the sheet material are held in position by guides **84** on opposite sides of the stock table **42** and by holddown plates **85** extending inwardly over the table and above the surface thereof.

In order to locate the leading edge of the work relatively to the dies so that there will be no loss in material between successive blanks I have provided gaging members in the form of fingers **86** mounted upon slides **88** and arranged to be reciprocated toward and away from the advanced edges of the openings **24** of the dies. These fingers are arranged to be moved into alinement with the edges of the openings at the end of an advance movement of the material and just before a punching operation and serve accurately to locate the forward edge of the sheet material along such edges.

In order to prevent the forward portion of the sheet material from being raised by the punches I have provided a stripper plate **90** extending transversely of the bed and spaced therefrom sufficiently to permit the passage of the sheet material beneath it.

Each of the slides **52** is reciprocated by means of a rod **92** connected to an adjustable eccentric **94** driven by a shaft **96** which in turn is connected by a chain belt **98** to an auxiliary shaft **100** driven by a belt **102** from the main shaft **34**. The slides **88** are similarly reciprocated by rods **104** connected to adjustable eccentrics **105** likewise driven by the belt **98**.

In the operation of the machine the sheet material is placed upon the stock table **42** and forced inwardly beneath the guides **82** on to the table **43**. Upon depression of the treadle **40**, the slides **52** are moved toward the dies with the result that the forward feed dogs **44**, **46**, **48** and **50** will frictionally engage the material to advance it to the dies and the slides **88** are moved inwardly to bring the ends of the fingers **86** into line with the forward edges of the openings **24** of the dies to locate the sheet material in operative position after which the slides move the fingers **86** away from the dies. The cross head **12** is then reciprocated with the result that the punches **14** cooperate with the dies to produce a series of blanks **20**, after which the slides **52** are moved rearwardly and the feed dogs rotate about their pivots to permit the rearward movement of the slides without moving the material which is then held stationary by the dogs **76**. These operations are repeated as long as there is material left in the sheet. As shown in Fig. 6, it is to be noted that the successive blanks formed have abutting side edges with the result that the only material wasted is that between the ends of adjacent blanks, as indicated at **106** and **108**, and a small amount of material at the marginal portions of the sheet.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A machine for operating upon sheet material comprising a frame, dies mounted in the frame, punches cooperable with the dies to produce blanks from sheet material, a table located adjacent to the dies, a slide mounted for movement along the table toward and away from the dies, feed fingers pivotally mounted upon the slide, means to force the fingers into frictional engagement with material positioned upon the table to feed the material during movements of the slide toward the dies and yieldable to permit movement of the slide away from the dies without moving the material, and gage members to arrest the advance of the material with leading edge portions thereof in alinement with edge portions of the dies.

2. A machine for operating upon sheet material comprising a frame, a plurality of dies arranged in a row and having edge portions which extend transversely of the frame, punches cooperable with the dies to produce blanks from sheet material, a table, means for intermittently advancing sheet material along the table toward the dies between successive punching operations, and gage members operative to locate the forward edge portions of the material in alinement with the said edge portions of the dies prior to each punching operation.

3. A machine for operating upon sheet material comprising a bed, a row of dies extending transversely of the bed, punches cooperable with the dies to produce blanks from sheet material positioned upon the bed, feed members for intermittently advancing the sheet material over the bed adapted to engage marginal portions of the material and gage means operative to engage the leading edge of the central portion of the material to locate the same in alinement with edge portions of the dies.

4. A machine for operating upon sheet material comprising a frame, a table, yieldable means for intermittently advancing sheet material along the table, a plurality of dies mounted in the frame in a row with edge portions thereof extending substantially in a line at right angles to the direction of advance of the material, gages mounted for movement toward and away from the row of dies, means for moving the gages in a direction opposite to the feed of material for successively locating the leading edge portions of material previously operated upon in alinement with said edge portions of the dies, and a plurality of punches cooperable with the dies for producing blanks.

5. A machine for cutting blanks from sheet material comprising a bed, a presser member mounted for reciprocation heightwise of the bed, a plurality of punches mounted upon the presser member, a plurality of dies mounted upon the bed and cooperable with the punches to produce blanks from sheet material, a table positioned adjacent to the dies, a slide mounted for movement along the table toward and away from the dies, feed fingers pivotally mounted upon the slide, means for forcing the fingers into frictional engagement with the upper face of the material during movements of the slide toward the dies to feed the material, and means for holding the material stationary during movements of the slide away from the dies.

6. A machine for operating upon sheet material comprising a frame, dies mounted in a row

extending transversely of the frame, a row of punches cooperable with the dies to produce blanks from sheet material, a table located adjacent to the dies, a slide mounted for movement along the table toward and away from the dies, feed members carried by the slide, said members being positioned upon opposite sides of the row of punches and constructed and arranged to engage marginal portions of a sheet of material positioned upon the table to advance the material intermittently past the row of dies between successive punching operations.

7. A machine for operating upon sheet material comprising a frame, a bed carried by the frame, a row of dies extending transversely of the bed, punches cooperating with the dies to produce blanks from sheet material advanced over the bed, a feed slide mounted for reciprocation along the bed, feed fingers pivotally mounted upon the slide upon opposite sides of the row of dies for advancing the material along the bed during movements of the slide in one direction, spring-pressed fingers pivotally mounted upon the frame for holding the material stationary during movements of the slide in the other direction, and means for locating forward edge portions of the material in operative position in alinement with edge portions of the dies.

8. A machine for operating upon sheet material comprising a bed, a row of elongated dies extending transversely of the bed, intermittently operated punches cooperable with the dies to produce blanks from sheet material positioned upon the bed, reciprocating means movable along the bed toward and away from the dies, and feed members pivotally mounted upon the reciprocating means and located adjacent to and upon opposite sides of the row of dies for engaging marginal portions of the material to advance the same past the dies.

WILLIAM J. DE WITT.