Sept. 24, 1935. R. W. CUMMINGS 2,015,066

MACHINE FOR OPERATING UPON SHEET MATERIAL

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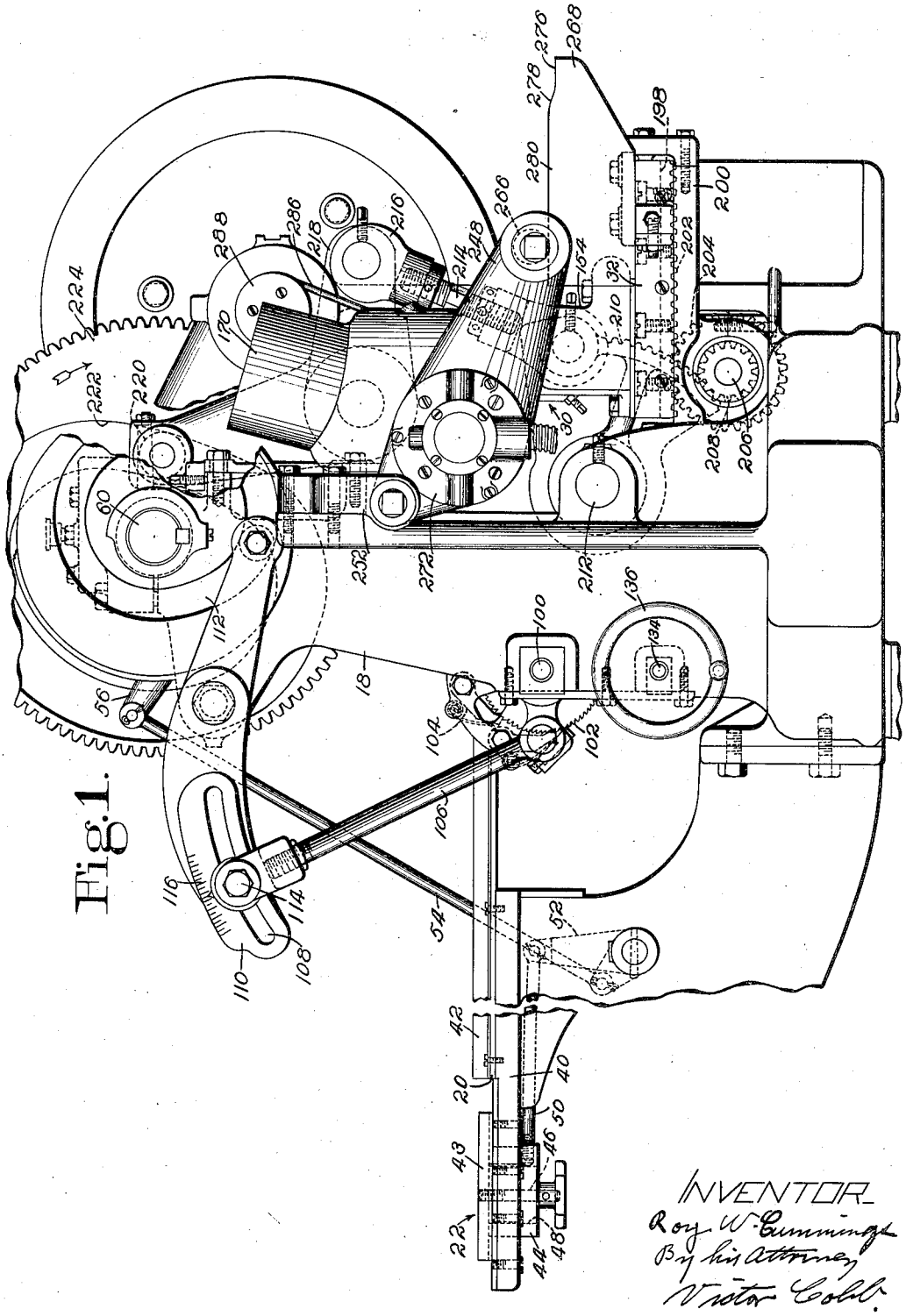


Fig. 1.

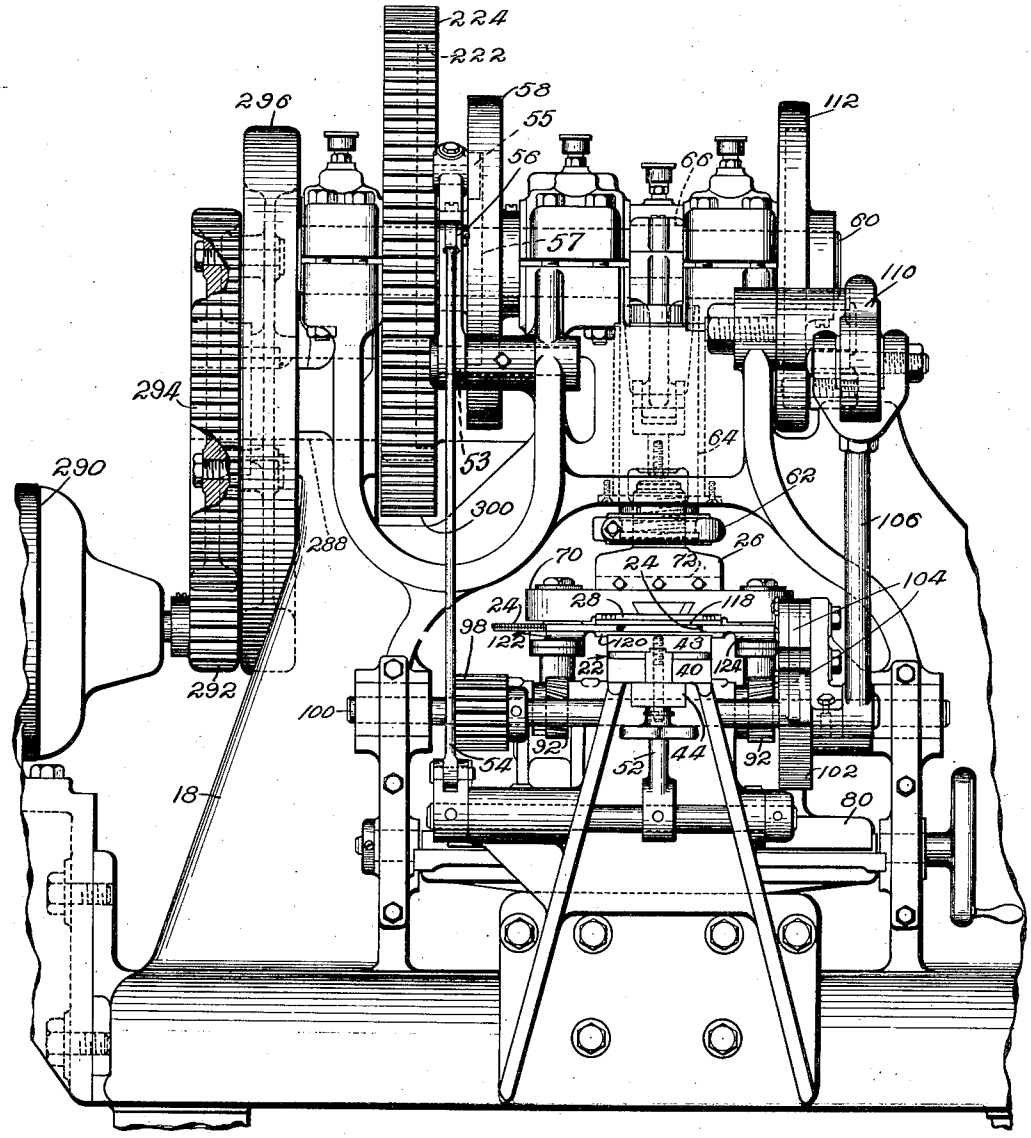
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Fig. 2.



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Fig. 4.

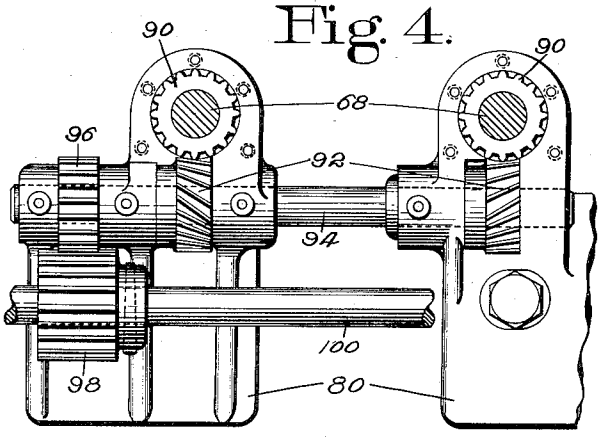


Fig. 5.

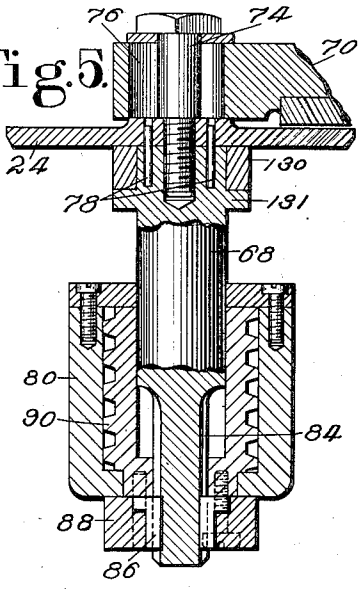
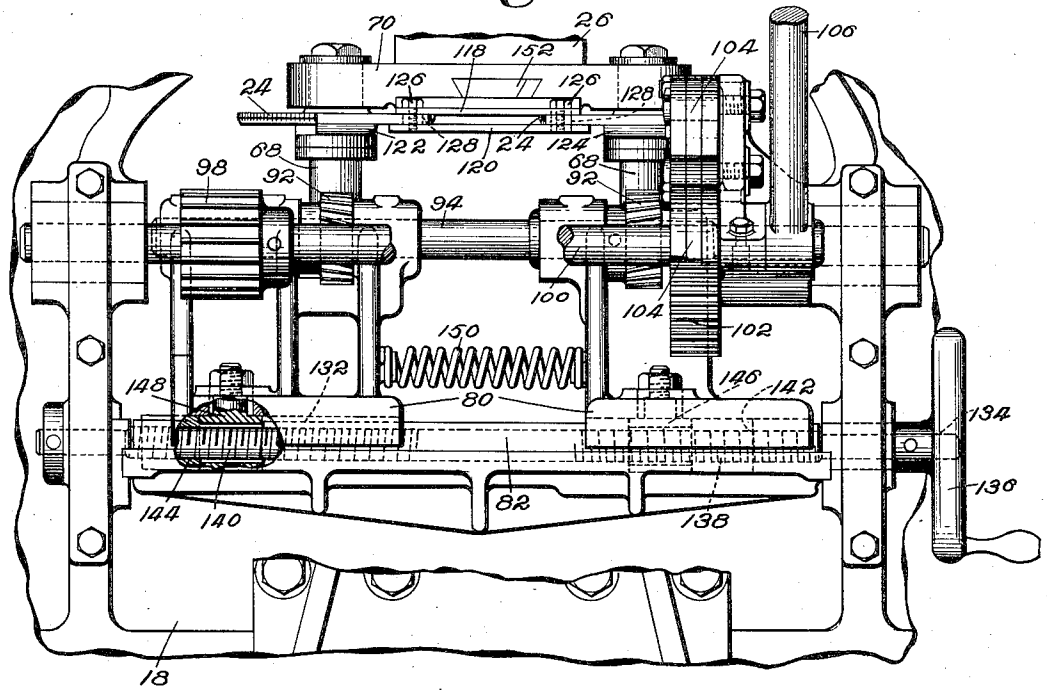


Fig. 3.



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Fig. 7.

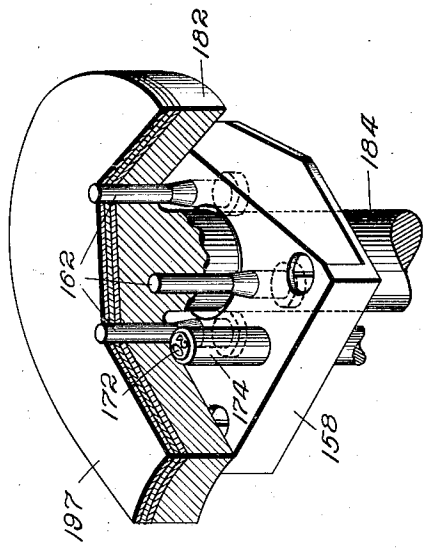


Fig. 6.

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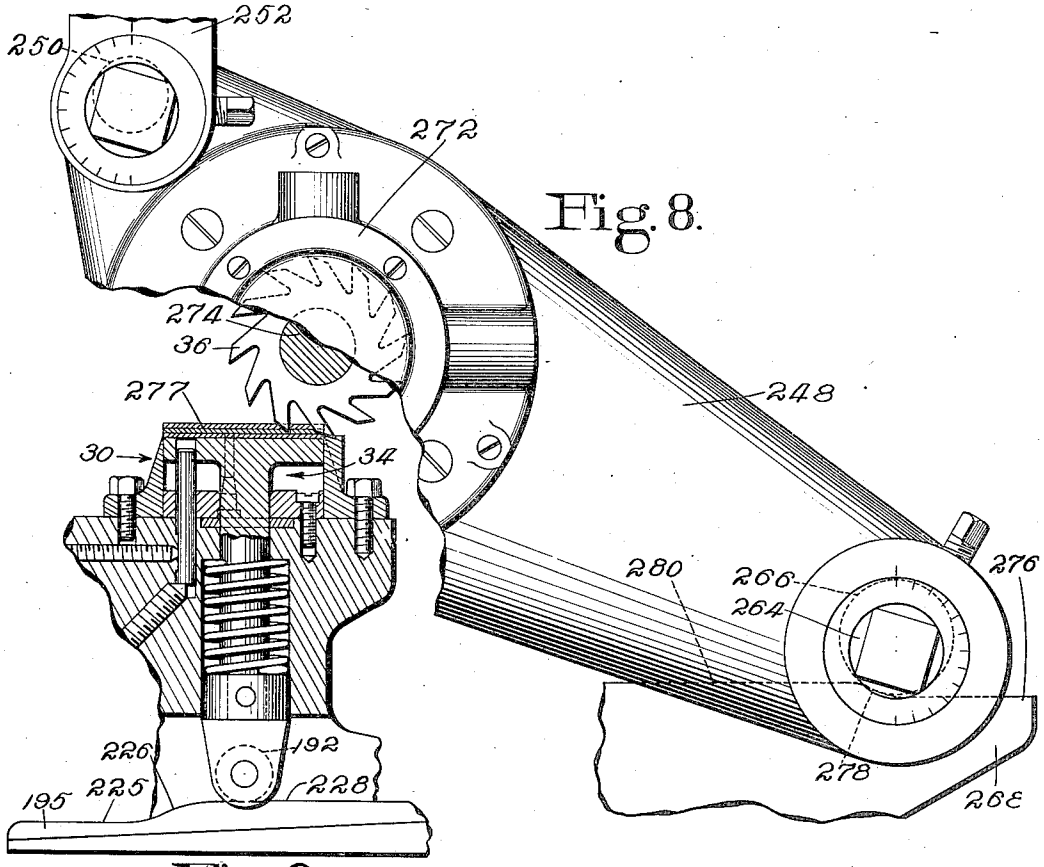


Fig. 8.

Fig. 9.

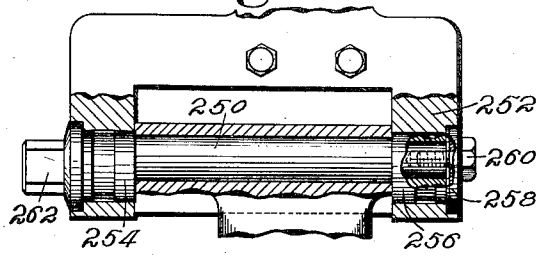


Fig. 10.

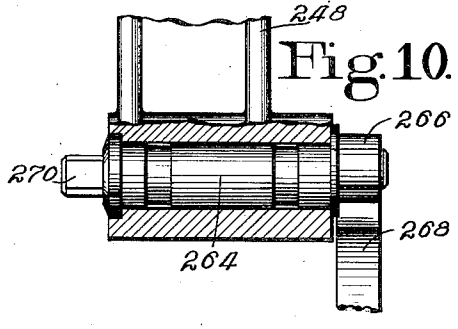
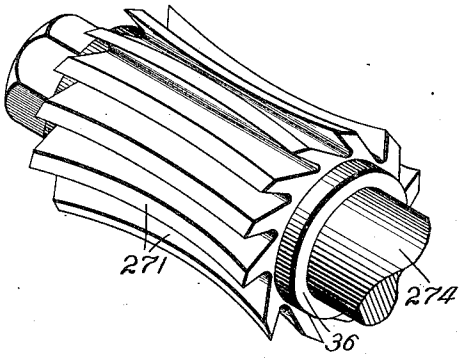


Fig. 11.



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Fig.12.

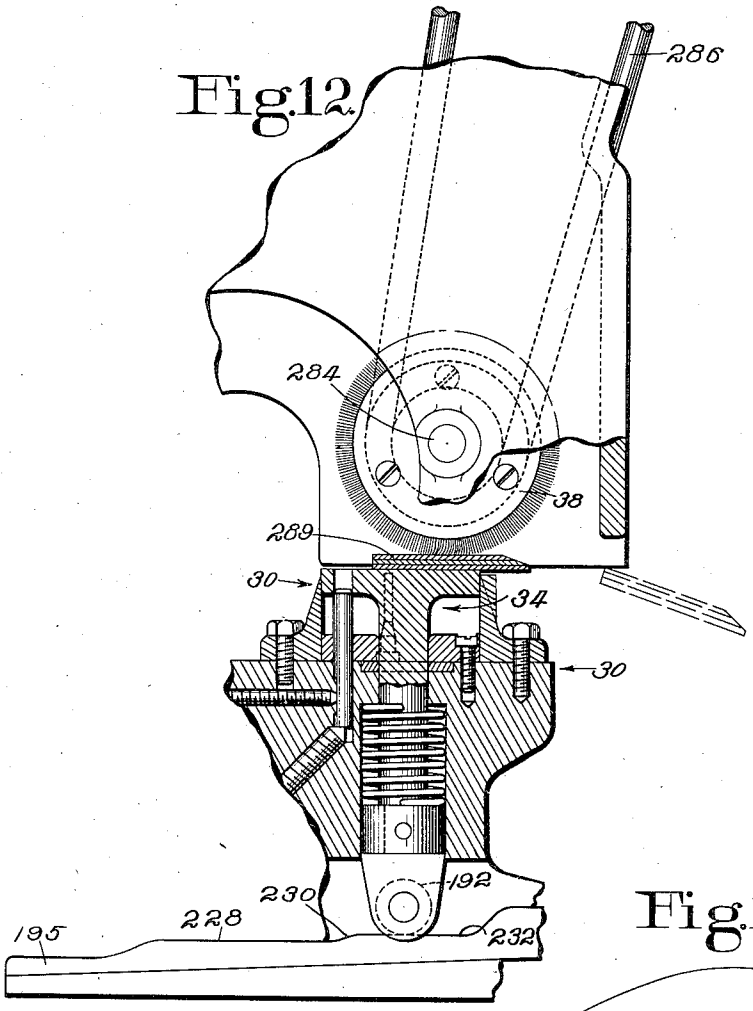


Fig.13.

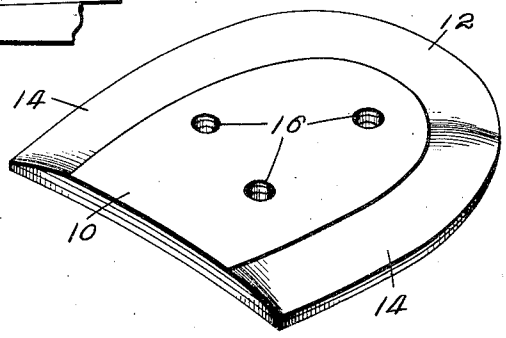
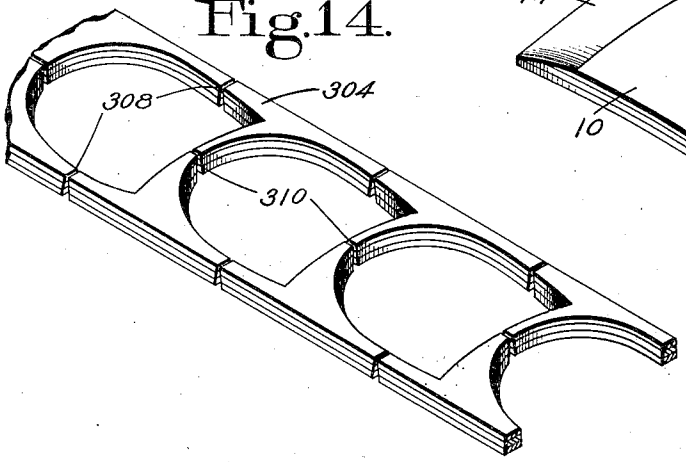


Fig.14.



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UNITED STATES PATENT OFFICE

2,015,066

MACHINE FOR OPERATING UPON SHEET MATERIAL

Roy W. Cummings, Beverly, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application May 18, 1931, Serial No. 538,154

36 Claims. (Cl. 164—12)

This invention relates to machines for operating upon sheet material and is herein illustrated as embodied in a machine for producing finished blanks, such as, for example, rubber-heel cores of the type disclosed in United States Letters Patent No. 1,741,037, granted December 24, 1929 upon an application filed in the name of Clifford Roberts.

It is an object of the invention to provide a machine which will perform operations upon sheet material rapidly to produce finished blanks in large quantities and one which will at the same time effect economy in the use of material. To this end the invention provides in a machine of the type referred to a plurality of instrumentalities for operating upon sheet material located in the frame of the machine, and a blank carrier mounted in the frame and operable to locate a blank supported thereby successively in proximity to the instrumentalities, together with means for varying the position of the blank relatively to the carrier upon movement of the carrier from one instrumentality to the other successively to locate the blank in operative position relatively to certain of the instrumentalities.

As illustrated, the instrumentalities comprise a cutting block, a rotary cutter, and a blank-discharge mechanism, and the blank carrier comprises a die co-operable with the cutting block to produce a blank from a strip of sheet material advanced across the face of the cutting block. Preferably the die is movable to locate a blank, formed therein, in operative position relatively to the cutter and then relatively to the discharge mechanism, there being provided means for partially ejecting the blank from the die to present the blank to the cutter and for completely ejecting the blank from the die to present the blank to the discharge mechanism.

Preferably and as shown, the die is heel-shaped and is co-operable with the cutting block to produce heel-shaped blanks from sheet material such as, for example, leather or a strip made up of several plies of wood. The cutter is preferably provided with concave teeth operable to bevel the back and side portions of the blanks produced by the die.

In another aspect the invention provides novel cutting mechanism comprising a reciprocating member and a die co-operable with the member to produce a blank from sheet material, together with feeding mechanism carried by the reciprocating member for advancing a strip of material between the member and the die. Preferably and as shown, the reciprocating member carries a head, a cutting block and disk-shaped feed rolls located substantially in a plane parallel to the operative face of the cutting block and operable to advance a strip of material along the face of the cutting block, the feed rolls being arranged to be driven intermittently by mechanism supported on the frame and in continuous operative engagement with the feed rolls.

Machines constructed as above outlined are adapted for use in forming blanks from sheet material and in performing beveling operations upon such blanks to produce finished articles, such as rubber-heel cores, having beveled back and side portions. The illustrated construction and arrangement of parts are such as to make it possible rapidly to present material to the various operating instrumentalities in succession with the result that the machine is of great capacity. By reason of the novel construction and arrangement of feed rolls above indicated, the rolls can be located close to the die, thus making it possible to maintain the material under the control of the feed rolls throughout the feeding operation while at the same time making it possible to utilize substantially the full width and length of the material to be cut into blanks with the result that considerable saving is effected in the amount of material used.

Other objects and features of the invention will be apparent from the following detailed description when taken in connection with the accompanying drawings and will be pointed out in the claims.

In the drawings,

Fig. 1 is a side elevation of a machine illustrating one embodiment of the invention;

Fig. 2 is a front elevation of a portion of the machine;

Fig. 3 is a front elevation of a portion of the machine, illustrating the mounting and drive for the feed rolls;

Figs. 4 and 5 are views illustrating details of the feed-roll-driving mechanism;

Fig. 6 is a side elevation, partly in section, illustrating the cutting block and die;

Fig. 7 is a detail view, partly in section, of the ejector and punch plate;

Fig. 8 is a side view, partly in section, illustrating the cutter in operative relation to the die;

Figs. 9 and 10 are plan views, partly in section, showing mechanism for adjusting the position of the cutter;

Fig. 11 is a perspective view illustrating the cutter;

Fig. 12 is a side view, partly in section, of a die

in operative relation to the discharge mechanism;

Fig. 13 is a perspective view of a finished blank; and

Fig. 14 is a diagrammatic view illustrating the manner in which blanks are cut from a strip of sheet material.

The illustrative machine is particularly designed for operation upon strips composed of several plies of wood to produce rubber-heel cores, a typical example of which is a core such as core 10 shown in Fig. 13 and which has beveled back and side surfaces 12 and 14, punched positioning-pin holes 16, and a size marking (not shown) stamped upon its lower face.

In the embodiment shown in the drawings (Figs. 1 and 2), the machine comprises a frame 18 having a support 20 for strips of stock and a feed slide 22 for advancing the stock to feed rolls 24 which are carried by a reciprocatable head 26 and which operate to advance the stock intermittently along the face of a cutting block 28 secured to the hear 26. Co-operable with the cutting block 28 is a die 30 (Fig. 6) effective upon descent of the head to cut a heel-shaped blank from a strip of stock and simultaneously to punch and to stamp the blank. After the dieing-out operation the die 30 acts as a blank carrier and is moved laterally by a slide 32 to present (Fig. 8) a cut blank, partially removed from the die 30 by an ejector 34, to a cutter 36 operative to bevel the back and side portions of the blank and then to present the blank to mechanism including a brush 38 (Fig. 12) for discharging the completely formed blank from the machine.

The stock support 20 (Figs. 1 and 2) consists in a plate which is supported in a horizontal position by a bracket 40 secured to the frame 18. The plate 20 is provided along its sides with vertically positioned guides 42 extending the full length thereof for guiding a strip of stock into proximity to the feed rolls 24. The feed slide 22 comprises a feed plate 43 and a downwardly extending projection 44 to which the plate is secured by means of a bolt 46 extending through an elongated slot 48 in the projection. The projection 44 is mounted in a slot in the outer end of the bracket 40 and is arranged to reciprocate the feed plate 43 along the bracket. This is accomplished by a link 50 connected to a bell-crank lever 52 pivotally secured to a second link 54 which is operated by a bell-crank lever 56 pivoted on stud 53 and carrying a roll 55 engaging track 57 in cam 58 on a drive shaft 60. Reciprocation of the feed plate 43 operates to advance a strip of stock, positioned upon the support 20, a short distance sufficient to cause the end of the stock to engage feed rolls 24. In order to provide for the feeding of strips of material of different lengths the operative position of the feed plate 43 relative to the bite of the rolls 24 is arranged for adjustment by loosening the bolt 46 and moving the slide longitudinally of the projection 44.

The head 26 which carries the feed rolls is secured, by a collar 62 (Fig. 2), to a plunger 64 which is reciprocated by an eccentric 66 mounted on the drive shaft 60.

The feed rolls 24 comprise two toothed disks positioned with their axes extending at right angles to the operative face of the cutting block 28, the disks being located substantially in a horizontal plane parallel to the face of the block. The feed rolls are carried by studs 68 which depend from a plate 70 having a dovetail 72 engaging the head 26 so that the plate and feed rolls are reciprocated with the head. Each of the studs 68 (Figs. 3, 4, 5 and 6) is secured to the plate 70 by a bolt 74 which extends through an elongated slot 76 in the plate, through a feed roll 24, and into the stud. The slots 76 provide for lateral adjustment of the studs 68 with feed rolls 24 carried thereby relatively to the plate 70 and to each other to adjust the rolls for feeding stock of different widths. Each of the feed rolls is secured to its corresponding stud 68 for rotation therewith by pins 78. The studs 68 extend downwardly into engagement with brackets 80 which are mounted for lateral movement relatively to each other on a slide 82 on the machine frame. The lowermost end of each of the studs 68 is splined, as indicated by reference character 84, and makes engagement with a key 86 in a collar 88 which is pinned to a worm gear 90 in the bracket 80. The gears 90 are driven by spiral gears 92 keyed to but movable along a shaft 94 loosely supported in the brackets 80. The shaft 94 bears a gear 96 which is driven by a pinion 98 carried by a shaft 100 supported in the frame. The shaft 100, in turn, is driven intermittently by a gear 102 and pawls 104 which are carried by a link 106 (Figs. 1, 2 and 3) pivotally mounted in a slot 108 in an arm 110 to which is imparted a rocking motion by a cam 112 secured to the main shaft 60. The construction and arrangement of the mechanism for driving the feed rolls 24 is such that the rolls are rotated sufficiently by a single oscillation of the link 106 to advance a strip of stock a distance equal to the length of a blank to be cut plus a small amount corresponding to the distance between two blanks to be cut from the strip. The length of feeding movement can be varied by shifting the upper end of the link 106 in its slot 108, and the setting can be maintained by tightening a nut 114 in the end of the link 106. The arm 110 is provided with a scale 116 by which the proper setting of the pivot point of the link 106 can readily be determined for the feed for producing different sizes of blanks.

In order to guide the end of a strip advanced by the slide 22 to the feed rolls 24, there are provided upper and lower guide plates 118 and 120 (Figs. 2, 3 and 6) which are secured to brackets 122 and 124 by means of bolts 126 which extend through the plates and through elongated slots 128 in the brackets 122 and 124. The plates 118 and 120 are so located that a strip of stock advanced between them will be guided along the lower face of the cutting block 28 and substantially in the plane of the feed rolls. The forward edge portions of the plates are beveled to facilitate entrance of the stock between the plates. Each of the brackets 122 and 124 is supported by a collar 130 (Fig. 5.) carried by a shoulder 131 on the stud 68 and consequently the plates are movable vertically and laterally with the studs. The elongated slots 128 provide for the lateral adjustment of the brackets 122 and 124 relatively to each other and to the plates 118 and 120.

Mechanism is provided for adjusting the feed rolls 24 toward or away from each other in order that they can be properly positioned for feeding strips of stock of different widths. To this end and as above mentioned, the feed rolls are arranged for movement laterally of the plate 70 by means of the bolt-and-slot construction 74, 76 and the feed-roll-driving mechanism which is carried by brackets 80 mounted on the slide 82. The slide 82 has a bore 132 within which is located a shaft 134 operable by means of a hand-

wheel 136 and provided near its ends, respectively, with right and left-hand screw threads 138 and 140 which engage nuts 142 and 144 slidable in the bore 132. These nuts are arranged to engage adjustable studs 146 and 148 carried by the brackets 80. Upon rotation of the hand-wheel 136 in one direction, the nuts are drawn toward each other, and by engagement with the studs 146 and 148 the brackets are likewise moved toward each other. Since the brackets carry the studs 68, this results in similar movement of the feed rolls 24. Upon movement of the hand-wheel in the opposite direction, a spring 150 forces the brackets apart and causes the feed rolls to move away from each other, the movement of separation being limited by the engagement of the studs 146 and 148 with the nuts 142 and 144. It is to be noted that before adjusting the brackets by the hand-wheel 136, each bolt 74 and the nuts 128 are loosened to permit movement of the feed rolls relatively to the plate 70 and to the plates 118 and 120. The teeth of the gear 98 extend longitudinally a sufficient distance so that they will continue to mesh with the gear 96 during movement of the latter with the brackets 80 relatively to the shaft 100. By means of the construction just described, the feed rolls 24 can be adjusted toward or away from each other into position with the peripheries of the rolls spaced to provide for the initial feeding of the stock between them by the feed slide 22 and at the same time to provide for the engagement of the teeth of the rolls with the side portions of the stock under sufficient pressure to feed the stock along the lower surface of the cutting block 28.

As shown in Figs. 3 and 6, the cutting block 28 is secured to the plate 70 of the head by means of a dovetailed slide 152 so that the cutting block is reciprocated with the head 26. Furthermore, since the guide plates 118 and 120 move with the head, stock guided thereby to the feed rolls 24 is advanced step by step across the under surface of the cutting block and is thus always located in operative position for the dieing-out operation when the head is brought down upon the die 30.

The die 30, which is mounted upon a base 154 and secured thereto by bolts 156, is of hollow construction and has up-standing heel-shaped cutting edges 155. Located within the interior of the die is a punch plate 158 (Figs. 6 and 7) secured to the die base 154 by screws 160 and carrying a plurality of punches 162 which extend upwardly slightly above the cutting edges 155. In the cutting block 28 there are provided female punch members, one of which is indicated by reference character 164, in alinement with the punches 162 and co-operable therewith upon descent of the cutting block 28 to punch positioning-pin holes in a blank simultaneously with the dieing out of the blank. The cutting block is provided with openings, one of which is indicated by reference character 166, in alinement with the punches and has a hollow 168 in the head adapted to receive scrap material forced upwardly through the openings by the punches 162. The scrap material may be conveniently withdrawn from the head by suction means preferably comprising a suction pipe 170 (Fig. 1). Also located within the die is a stamp 172 forming part of a pin 174 which extends through the punch plate 158 into the die base 154. The die base carries a set screw 176 arranged to engage the lower end of the pin 174 and by which the height of the stamp can be adjusted. The stamp can be locked in adjusted position by set screw 178 which extends through the die base 154 into engagement with a flattened side portion 180 of the pin 174. The pin is normally adjusted into position with its upper end bearing the stamp 172 located somewhat below the cutting edges of the die so that it will engage the lower face of a blank forced into the die by the cutting block 28.

The ejector 34 which operates to eject cut blanks from the die comprises a plate 182 located wholly within the die and borne at the upper end of a plunger 184 which is normally forced downwardly out of operative position by a spring 186 which bears against an abutment 188 in the die base and on a collar 190 secured to the lower end of the plunger. The collar 190 carries a roll 192 which extends into a longitudinal slot 194 in the die base and is arranged to engage an ejector-operating cam 195.

Fig. 6 illustrates the position of the head 26 at the bottom of its stroke after having forced a strip of material 196 upon the cutting edges 155 of the die to form a heel-shaped blank 197, the punches 162 and the stamp 174 being shown in operative position relatively to the blank 197. It is to be noted that the ejector plate 182 during this operation is withdrawn out of operative position.

The die base 154 is arranged for movement laterally of the head 26 for presentation of a cut blank to the cutter 36 and later for movement of the completed blank to the discharge mechanism. To this end the die base 154 (Figs. 1 and 6) is secured to the slide 32 supported on ways 198 of a carriage 200 fixedly secured to the frame of the machine. The lower central portion of the slide 32 is provided with a rack 202 in mesh with a gear 204 on a shaft 206. The shaft 206 is driven by a pinion 208 on the shaft which meshes with a gear sector 210 pivoted at 212 on the frame and having pivotally connected thereto an adjustable link 214. The link 214 has a bifurcated end portion 216 which is connected to one end of a bell-crank lever 218 the other end of which carries a roll 220 making engagement with a cam track 222 in a gear 224 carried by the main shaft 60. By means of the connections set forth the slide 32 is given a reciprocating movement so timed relatively to the descent of the head 26 that the slide 32 and die 30 carried by it are located in operative position for a cutting operation upon stock advanced across the lower face of the cutting block 28. The die is then moved by the slide successively into position for operation of the cutter upon the blank and into position for discharging the blank.

The cam 195 is provided with three flat portions or dwells connected by curved portions which operate the ejector 34 in proper timed relation to movements of the slide 32. The portion 225 of the cam 195 is normally engaged by the roll 192 of the ejector when the slide is located at the dieing-out station at which time the ejector is maintained at its lowermost position below the cutting edges of the die. A portion 226 of the cam is effective, after the dieing-out operation and as the slide 32 is moved rearwardly, to raise the ejector plate 182 a sufficient distance partially to remove the cut blank from the die to locate it in position for operation by the cutter 36. The portion 228 of the cam maintains the ejector plate, and consequently a blank in the die, at a fixed level during the operation of the cutter. A portion 230 of the cam is operative after operation of the cutter

36 to raise the ejector plate 182 slightly above the cutting edges of the die with the result that the blank is completely removed from the die. The portion 232 of the cam maintains the ejector plate in its highest position during movement of the slide in effecting discharge of the blank from the machine. The cam 195 has a tapered lower surface 234 which rests upon a wedge 236. The wedge can be moved longitudinally of the cam by means of a screw 238 which is carried by a bracket 240 secured to the carriage 200. The purpose of the longitudinal adjustment of the wedge is to effect a raising or lowering of the operative surface portions of the cam 195 to provide for adjustment of the range of movement of the ejector plate 182 for operating upon blanks of different thicknesses or upon blanks in which varying degrees of bevel are desired. The cam 195 is provided at its outer end with a downwardly projecting ear 242 through which extends a setscrew 244 carried by bracket 240. The purpose of the screw 244 is to provide for longitudinal adjustment of the cam 195 in effecting variations in the timing of the movements of the ejector. The ear 242 is provided with an elongated slot 246 through which the screw 238 passes so that the screw will not engage the ear and prevent vertical adjustment of the cam. The bracket 240 is provided with an elongated slot 247 through which the screw 244 passes likewise arranged so that the screw 244 will not prevent vertical movement of the cam by engagement of the screw with the bracket.

The cutter 36 is mounted in an arm 248 (Figs. 8 and 9) through one end of which extends a pin 250 carried by a bifurcated bracket 252 on the machine frame. The pin 250 has integral with it at one end a bearing 254 the axis of which is eccentric to that of the pin. The other end of the pin 250 has a similar bearing 256 which is removable to permit assembly of the parts and which is normally held in position by a washer 258 keyed to the pin and bushing and locked by a bolt 260. The outer end of the bearing 254 is in the form of a nut 262 by which the angular position of the pin can be varied. The other end of the lever 248 carries a pin 264 (Figs. 8 and 10) which has a roll 266 positioned on the pin eccentrically to the axis thereof and adapted to engage a cam 268 which is secured to the upper face of the slide 32. The pin 264 has a nut 270 for adjusting the angular position of the axis of the roll 266. By means of the pins 250 and 264, the initial position of the arm 248, and consequently of the cutter 36, can be adjusted to a limited extent relatively to the supports for the arm, namely, the bracket 252 and the cam 268, and the arm and cutter are free at all times to move angularly about the pin 250.

The cutter 36, best illustrated in Fig. 11, is generally cylindrical in shape and is provided with elongated, concaved, arcuate teeth 271. The cutter 36 is driven by a motor 272 carried by the arm 248, the cutter being mounted upon the motor shaft 274, the axis of which extends transversely to the path of lateral movement of the die, the cutter being located with the central portions of its teeth 271 slightly above the plane of the cutting edges of the die 30.

In the position of the die slide 32 in which the dieing-out operation takes place, the cam 268 is so located that a portion 276 of its surface engages the roll 266 to support the cutter with the teeth thereof extending slightly above the cutting edges of the die. Upon movement of the slide 32 rearwardly, after the dieing-out operation, the portion 226 of the cam 195 causes operation of the ejector 34 to raise the upper surface of the cut blank slightly above the cutting edge of the die 30 and upon further movement of the slide rearwardly the blank will be brought into engagement with the central portions of the teeth of the cutter 36 to produce a bevel, such as bevel 12 (Fig. 13) on the back of the blank. This is illustrated in Fig. 8 which shows a blank 277 with its rear portion in operative position relatively to central portions of the teeth 271 of the cutter 36. Upon still further movement of the slide 32 rearwardly, the cutter will be raised gradually by a surface 278 on the cam 268 until the central portions of the teeth of the cutter are above the upper surface of the cut blank but with the side portions of the teeth in alinement with the uncut corners at the side margins of the blank. Continued rearward movement of the slide will result in the advance of the blank past the cutter, the outer edges of which will produce a bevel, such as bevel 14 (Fig. 13) upon the side portions of the upper surface of the blank, the cutter 36 being maintained in the same position during the side beveling operation by engagement of the pin 264 with a flat portion 280 on the cam 268. Variations in the bevels produced in blanks can be readily effected by adjusting the position of the arm 248 heightwise and longitudinally of the die 30, which is accomplished by rotating the pins 250 and 264 in their bearings.

The mechanism for discharging the blank after the beveling operation comprises the brush 38 (Fig. 12) which is carried by a shaft 284 mounted in the frame and continuously driven by a belt 286 operatively connected to a drive shaft 288 (Fig. 1). Upon movement of the slide 32 into the discharge position the ejector 34 is operated by the portion 230 of the cam 195 completely to remove the blank from the die 30 and to force the blank into frictional engagement with the brush 38 which ejects the blank from the machine. Fig. 12 illustrates a finished blank 289 which has been completely removed from the die 30 and brought into engagement with the brush 38 to be discharged from the machine.

For driving the various mechanisms above described, there is provided an electric motor 290 (Fig. 2) the shaft of which carries a pinion 292 making engagement with a gear 294 secured to a flywheel 296 which is mounted upon the shaft 288. Secured to the shaft 288 is a gear 300 which is in mesh with the gear 224 secured to the drive shaft 60. Mechanisms for actuating the strip feed slide 22 and feed rolls 24, and for reciprocating the die slide 32, are connected to the drive shaft 60 as before mentioned. The belt 286, however, is driven directly from the shaft 288.

Fig. 14 indicates diagrammatically the manner in which the blanks are cut in sequence from a strip, such as the strip 304. In order to prevent choking of the machine by accumulation of scrap, the die 30 is provided with a plurality of chisels, one of which is indicated by reference character 306 (Fig. 6), which are operative to sever the stock between the died-out portions and the margins, as indicated by reference character 308, and to sever the stock between spaces left by successive dieing-out operations, as indicated by reference character 310. The scrap stock which is thus separated into comparatively small pieces falls from the die out of the machine. It is to be noted that, since the feed rolls 24 are arranged to engage the stock at the sides thereof and since

the rolls extend substantially in the plane of the stock, the feed rolls can be so adjusted that their peripheries are close to the cutting edges 155 of the die 30 on opposite sides thereof. This results in considerable saving in material by reason of the fact that the strips need not be of a width much greater than that of the die used.

In the operation of the machine, a strip of sheet material is advanced by feed slide 22 across the work support 20 until the end of the strip, guided by plates 118 and 120, is engaged by feed rolls 24 which advance the strip along the operative face of the cutting block 28. Upon completion of the movement of the feed rolls the cutting block 28 is moved downwardly to force a portion of the strip into the die 30 which has been moved by the die slide 32 into alinement with the cutting block. As the material is forced into the die the punches 162 operate to punch holes in the blank, and the stamp 172 impresses a size marking upon the under side of the blank. Upon completion of the dieing-out operation the slide 32 is moved laterally carrying with it the die 30 and the blank located therein toward the cutter 36, and the cam 195 operates the ejector 34 partially to eject the blank from the die to present it in operative position heightwise of the cutter 36. As the slide 32 continues its movement, the central portions of the teeth of the cutter operate to bevel the back of the blank. The cam 268 gradually raises the end of the arm 248 carrying the cutter until the central portions of the teeth of the cutter are clear of the blank, after which continued movement of the blank past the cutter results in the beveling of the side portions of the blank by the outer edge portions of the teeth of the cutter. Upon still further movement of the die and blank, cam 195 completely ejects the blank from the die, locating it in operative position heightwise of the brush 38 which frictionally engages the upper surface of the blank to eject it from the machine. The slide 32 is then operated to return the die 30 into alinement with the cutting block, and the cycle of operations is repeated with the exception, however, that the feed rolls 24 are operated intermittently to effect the advance of the strip of material along the face of the cutting block once during each reciprocation thereof without further operation of the slide 22 until the strip is exhausted, at which time the slide is again operated to feed a new strip to the feed rolls.

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, a plurality of instrumentalities for operating upon sheet material located in the frame, a blank carrier slidably mounted in the frame for positioning a blank supported thereby successively in proximity to the operating instrumentalities, and means for varying the position of the blank relatively to the carrier upon movement of the carrier from one instrumentality to another successively to locate the blank in operative position relatively to certain of said instrumentalities.

2. A machine for operating upon sheet material, comprising a frame, a plurality of instrumentalities mounted in the frame and arranged to operate upon sheet material to produce finished blanks, a die co-operable with one of the instrumentalities to form a blank, means for moving the die relatively to the frame successively to locate a blank carried by the die into proximity to the other instrumentalities, and means for varying the position of the blank relatively to the die to locate the blank for an operation to be performed upon it by one of the instrumentalities.

3. A machine for operating upon sheet material, comprising a frame, a plurality of instrumentalities mounted in the frame and arranged to operate upon sheet material to produce finished blanks, a hollow die co-operable with one of the instrumentalities to form a blank within the die, means for moving the die and blank carried thereby successively into proximity to other of the instrumentalities, and means for moving the blank relatively to the die successively to locate the blank in operative position relatively to said instrumentalities.

4. A machine for operating upon sheet material, comprising a frame, a plurality of instrumentalities for operating upon sheet material located in the frame, a slide mounted in the frame, a die carried by the slide and movable therewith successively into operative position relatively to said instrumentalities, one of said instrumentalities comprising a reciprocating cutting block for forcing a portion of a strip of sheet material into the die thereby to form a blank, means for partially ejecting the blank from the die upon movement of the die to a second instrumentality, and means for completely ejecting the blank from the die upon movement of the latter to a third instrumentality.

5. A machine for operating upon sheet material, comprising a frame, a cutting block, a rotary cutter and a discharge device carried by the frame, a slide mounted in the frame, a die carried by the slide and movable therewith successively into operative position relatively to the cutting block, cutter and discharge device, means for advancing sheet material into a position between the cutting block and die when the latter is located in operative position relatively to the cutting block, means for causing an operation of the cutting block to force a portion of the sheet material into the die thereby to form a blank, means operable upon movement of the die toward the cutter partially to eject the blank to present it in operative relation to the cutter, and means operative upon movement of the die toward the discharge device completely to eject the blank from the die to present the blank for discharge from the machine.

6. A machine for operating upon sheet material, comprising a die, a cutting block, means for causing relative movement between the die and cutting block to force into the die a portion of a strip of material presented between the cutting block and die thereby to form a blank, a cutter, and means for moving the die and blank therein into operative position relatively to the cutter.

7. A machine for operating upon sheet material, comprising a frame, a reciprocating cutting block, a rotary cutter, a slide mounted in the frame, a die carried by the slide and movable into operative relation respectively to the cutting block and the rotary cutter, means for causing the cutting block to force sheet material into the die to produce a blank, and means for partially ejecting the blank from the die to position the blank for operation relatively to the cutter.

8. A machine for operating upon sheet material, comprising a frame, a cutting block and a rotary cutter mounted in the frame, means for causing operation of the cutting block and die to

force sheet material into the die thereby to form a blank, means for moving the die from operative position relatively to the cutting block past the cutter, and means for partially ejecting the blank from the die to present the blank to the cutter for an operation upon the blank as the die is moved past the cutter.

9. A machine for operating upon sheet material, comprising a frame, a cutting block and a rotary cutter mounted in the frame, means for causing operation of the cutting block and die to force sheet material into the die thereby to form a blank, means for moving the die from operative position relatively to the cutting block past the cutter, means for partially ejecting the blank from the die to present the blank to the cutter for an operation upon the blank as the die is moved past the cutter, and means for varying the position of the cutter during movement of the die.

10. A machine for operating upon sheet material, comprising a frame, a co-operating cutting block and heel-shaped die mounted in the frame, means for causing operation of the cutting block to force into the die sheet material presented thereto thereby to form a blank, a rotary cutter for beveling marginal portions of the blank, means for moving the die past the cutter with the blank presented in operative relation to the cutter, and means for moving the die to a blank-discharge station.

11. A machine for operating upon sheet material, comprising a heel-shaped die, a cutting block for forcing material into the die thereby to form a blank, a cutter for producing bevels on the side and rear portions of the blank, means for advancing the die and blank into operative position relatively to the cutter, means for partially ejecting the blank to place it in position for the cutter to operate upon the rear portion of the blank, and means for varying the position of the cutter to render it operable upon the side portions of the blank.

12. A machine for operating upon sheet material, comprising a die, a head, a cutting block carried by the head, feed members mounted upon the head for advancing a strip of material along a face of the cutting block, means for moving the die into or out of operative position relatively to the cutting block, and means for causing relative movement between the cutting block and die when the latter is in operative position relatively to the block for causing an operation of the die upon the strip.

13. A machine for operating upon sheet material, comprising a plunger, a cutting block carried by the plunger, a die movable into and out of operative position relatively to the cutting block, means carried by the plunger for feeding a strip of sheet material along the operative face of the cutting block, and means for reciprocating the plunger to cause an operation of the die upon the strip when the die is in operative position relatively to the cutting block.

14. A machine for operating upon sheet material, comprising a reciprocating member, a die co-operable with the member to produce a blank from sheet material, and feeding mechanism carried by the member for advancing a strip of sheet material between the member and the die.

15. A machine for operating upon sheet material, comprising a reciprocating cutting block, a die co-operable with the cutting block to form a blank from sheet material, and feed rolls mounted for reciprocation with the cutting block for advancing a strip of material between the cutting block and the die.

16. A machine for operating upon sheet material, comprising a reciprocating cutting block, a die co-operable with the cutting block to form a blank from sheet material, feed rolls mounted for reciprocation with the cutting block, and means for advancing a strip of stock to the feed rolls.

17. A machine for operating upon sheet material, comprising a cutting block, a die co-operable with the cutting block to form a blank from sheet material positioned between the die and cutting block, and feed rolls located upon opposite sides of the die with their axes extending substantially at right angles to the operative face of the block and having their peripheral portions arranged to engage edge portions of the sheet material to advance the material across the face of the block.

18. A machine for operating upon sheet material, comprising a cutting block, a die co-operable with the cutting block to produce blanks from sheet material, disk-shaped feed rolls located adjacent to the cutting block on opposite sides of the die and having peripheral portions arranged to engage the edge portions of a strip of sheet material for advancing the strip between the feed rolls across the operative face of the cutting block, and means for intermittently driving the feed rolls.

19. A machine for operating upon sheet material, comprising a reciprocating cutting block, a die co-operable with the operative face of the cutting block to form a blank from sheet material, and means for feeding sheet material across the operative face of the cutting block comprising a plurality of disk-shaped feed rolls substantially located in a plane parallel to and in proximity with the face of the cutting block.

20. A machine for operating upon sheet material, comprising a die, a cutting block movable toward and away from the die, and means arranged for movement with the cutting block for feeding sheet material between the cutting block and the die.

21. A machine for operating upon sheet material, comprising a die, a head movable toward and away from the die, a cutting block carried by the head, a plurality of feed rolls carried by the head for advancing sheet stock across the operative face of the cutting block between the block and die, and means mounted on the head adjacent to the face of the cutting block for guiding stock to the feed rolls.

22. A machine for operating upon sheet material, comprising a die, a head movable toward and away from the die, a cutting block carried by the head, a pluraiity of feed rolls carried by the head for advancing sheet stock across the operative face of the cutting block between the block and die, guide members mounted on the head adjacent to the face of the cutting block for guiding stock to the feed rolls, and means for advancing the stock to said guide members.

23. A machine for operating upon sheet material, comprising a die, a head, a cutting block carried by the head, feed members mounted upon the head for advancing a strip of stock along the operative surface of the cutting block, and means for causing relative movement between the die and cutting block to produce an operation of the die upon the stock.

24. A machine for operating upon sheet material, comprising a die, a head mounted for reciprocation toward and away from the die, feed rolls carried by the head for advancing sheet stock

between the head and the die, and means for driving the feed rolls mounted in the frame and arranged in continuous operative engagement with the feed rolls.

25. A machine for operating upon sheet material, comprising a reciprocating cutting head, a die arranged for co-operation with the head, feed rolls for advancing stock between the head and the die constructed and arranged for movement with the head, and means for driving the feed rolls mounted in the frame of the machine and in continuous operative engagement with said feed rolls.

26. A machine for operating upon sheet material, comprising a die, a head, a cutting block carried by the head, feed rolls carried by the head for advancing a strip of stock along the cutting block, means for reciprocating the head to cause dieing-out operations upon the strip, and means for driving the feed rolls operable between dieing-out operations.

27. A machine for operating upon sheet material, comprising a die, a head, a cutting block carried by the head, feed rolls carried by the head, means for causing intermittent operation of the feed rolls to advance a strip of stock along the cutting block, and means for reciprocating the head to produce an operation of the die upon the strip between operations of the rolls in advancing the strip.

28. A machine for operating upon sheet material, comprising a die, head arranged for reciprocation relatively to the die, a feed roll carried by the head and having a depending portion, means for adjusting the feed roll laterally of the head, a bracket slidably mounted in the frame of the machine, and means mounted in the bracket and in continuous operative engagement with said portion for driving the feed roll.

29. A machine for operating upon sheet material, comprising a head, a die, feed rolls carried by the head for advancing sheet material between the head and the die and having each a depending member, a pair of brackets mounted in the frame of the machine, and means for driving each of the feed rolls mounted in the brackets and making operative connection with the depending members.

30. A machine for operating upon sheet material, comprising a head, a die, feed rolls carried by the head for advancing sheet material between the head and the die, said rolls being mounted on the head for movement of adjustment relatively to each other and having each a depending member, a pair of brackets slidably mounted in the frame of the machine, means for driving each of the feed rolls mounted in the brackets and making operative connection with the depending members, means for adjusting the brackets relatively to each other to provide for adjustment of the feed rolls, and driving means to render the rolls operable for the feeding of sheets of stock of different widths.

31. A machine for operating upon blanks formed from sheet material, comprising a frame, a blank carrier slidably mounted in the frame, an arm one end of which is pivotally mounted in the frame and the other end of which carries a roll, a rotary cutter carried by the arm for producing a bevel on the side portions of a blank supported by the carrier, and a cam for engaging the roll to vary the position of the cutter as the carrier and blank are advanced past the cutter.

32. A machine for operating upon blanks formed from sheet material, comprising a frame, a blank carrier mounted in the frame, an arm pivotally mounted in the frame, a cutter carried by the arm, means for advancing the carrier and a blank supported thereby past the cutter, means for varying the position of the cutter heightwise of the carrier, and means for varying the position of the blank heightwise of the cutter.

33. A machine for operating upon blanks formed from sheet material, comprising a frame, a rotary cutter mounted in the frame and having concave cutting portions, a blank carrier slidably mounted in the frame for movement past the cutter, means for so adjusting the position of the cutter relatively to the carrier that the central portions of the cutter are in position to operate upon a blank supported by the carrier, and means operable in timed relation to the movement of the carrier for locating the cutter with marginal portions thereof in position to engage the blank.

34. A machine for operating upon blanks formed from sheet material, comprising a frame, an arm one end of which is pivotally mounted in the frame and the other end of which carries a roll, a rotary cutter carried by the arm, a blank carrier mounted in the frame for movement past the cutter, and a cam on the carrier for engaging the roll to vary the position of the cutter relatively to the carrier as the latter moves past the cutter.

35. A machine for operating upon blanks formed from sheet material, comprising a frame, an arm one end of which is pivotally mounted in the frame and the other end of which carries a roll, a rotary cutter carried by the arm, a blank carrier mounted in the frame for movement past the cutter, a cam on the carrier for engaging the roll to vary the position of the cutter relatively to the carrier as the latter moves past the cutter, and means for varying the initial position of the cutter relatively to the carrier.

36. A machine for operating upon blanks formed from sheet material, comprising a frame, an arm one end of which is pivotally mounted in the frame and the other end of which carries a roll, a rotary cutter carried by the arm, a blank carrier mounted in the frame for movement past the cutter, a cam on the carrier for engaging the roll to vary the position of the cutter relatively to the carrier as the latter moves past the cutter, and means for varying the position of the cam relatively to the carrier.

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