

May 27, 1930.

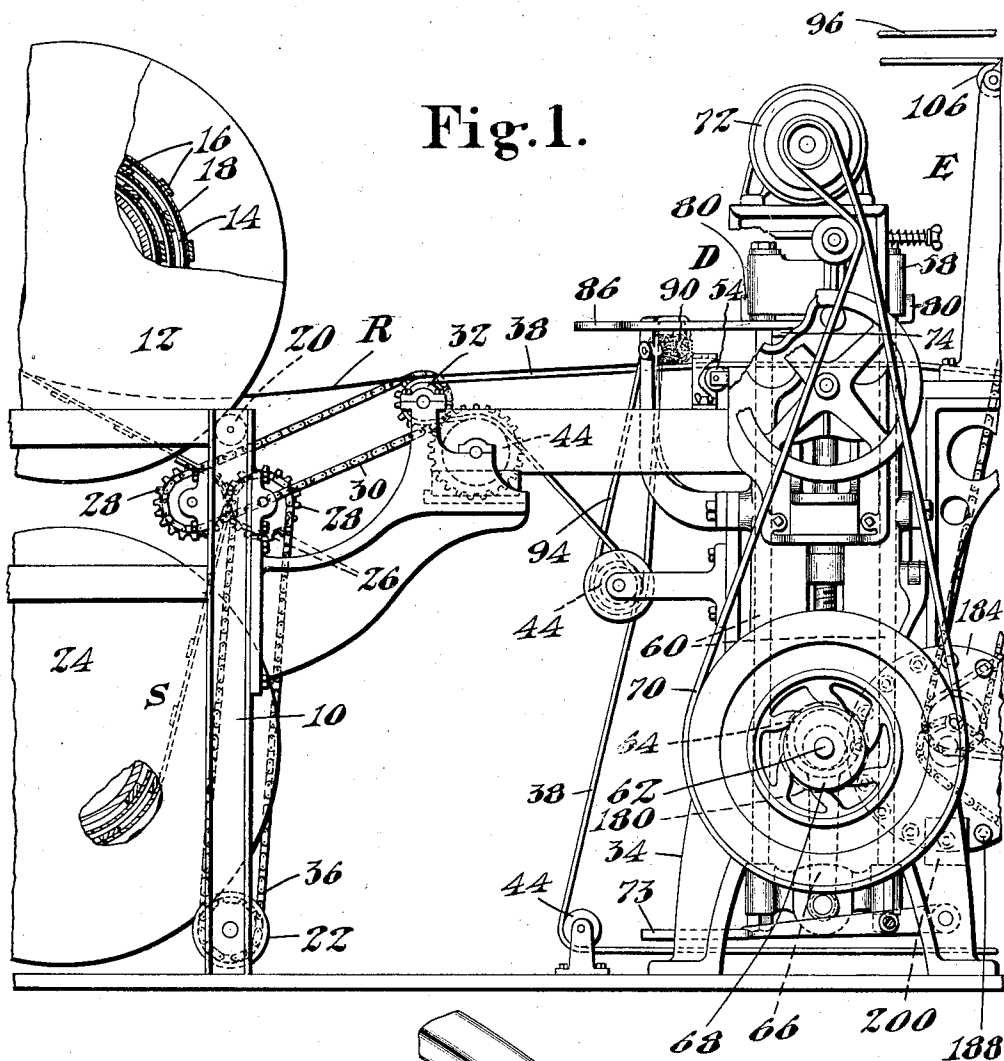
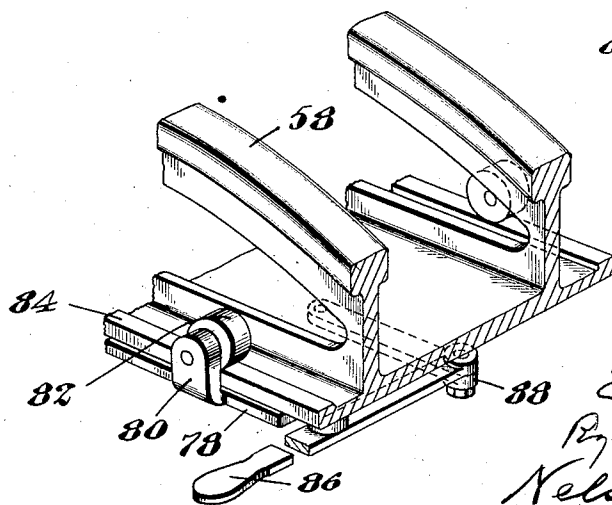
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1,760,019

MACHINE FOR CUTTING SHEET STOCK

Filed May 14, 1927

3 Sheets-Sheet 1



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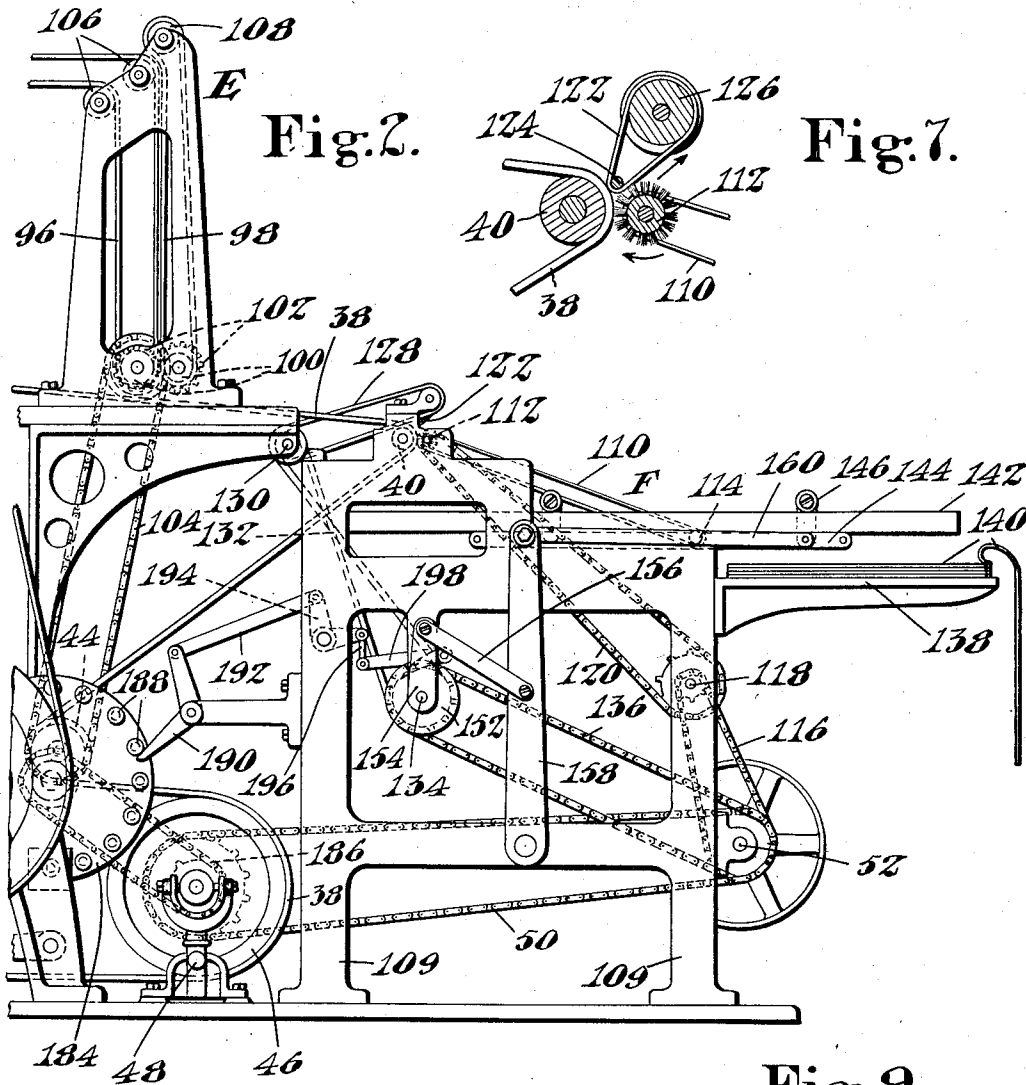
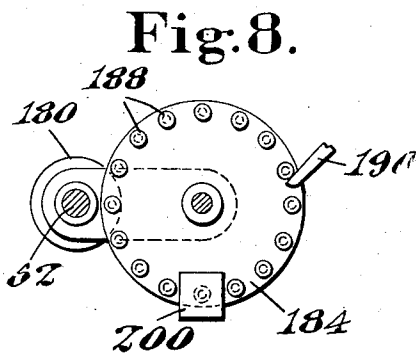
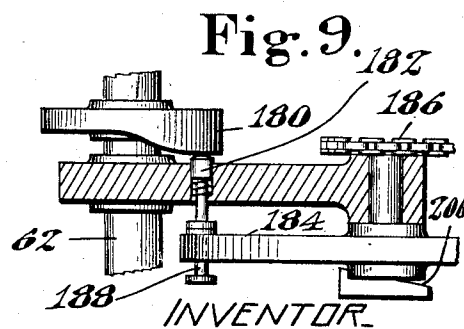
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MACHINE FOR CUTTING SHEET STOCK

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3 Sheets-Sheet 2



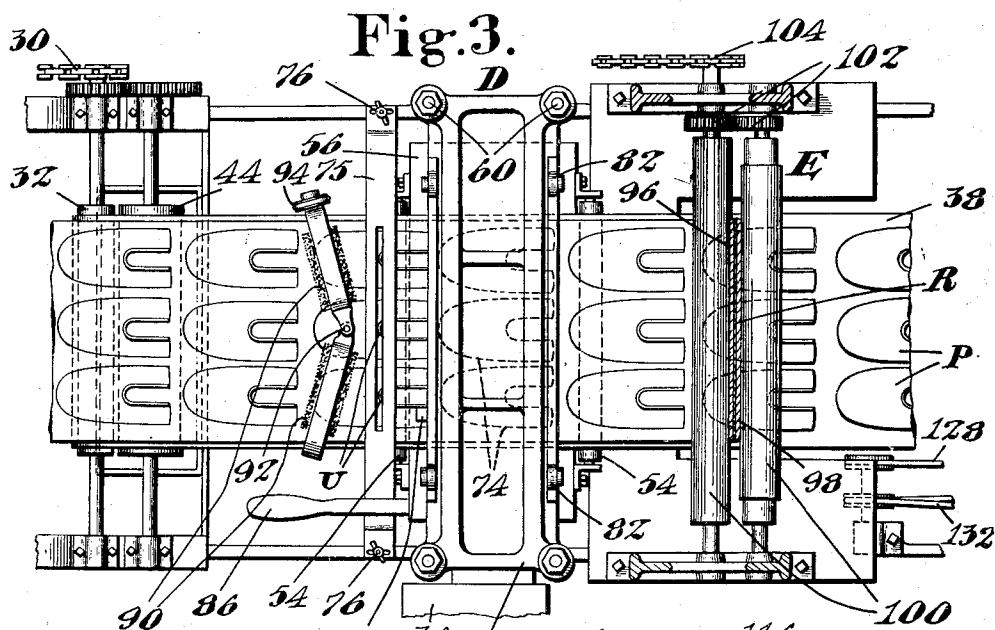
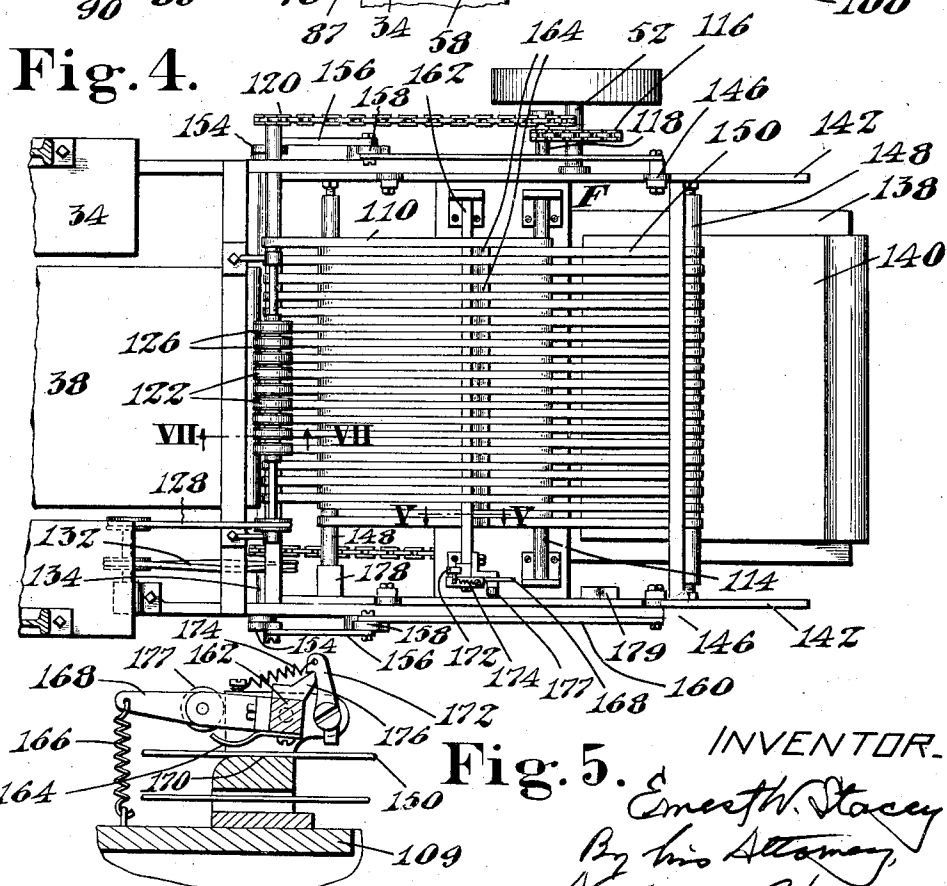
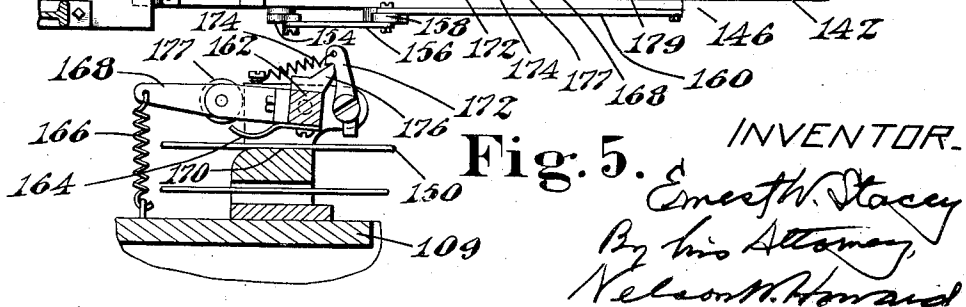
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MACHINE FOR CUTTING SHEET STOCK

Filed May 14, 1927

3 Sheets-Sheet 3



## UNITED STATES PATENT OFFICE

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## MACHINE FOR CUTTING SHEET STOCK

Application filed May 14, 1927. Serial No. 191,458.

This invention relates to machines for cutting sheet-material, it being particularly designed for producing uppers or other footwear-portions from rubber-stock.

5 A common procedure in cutting uppers for gum shoes or rubbers is to produce by calendering sheets of rubber-stock of a proper thickness, upon the surface of which a design is embossed by the calender-rolls. This design may consist of a certain number of outlines in the form of an upper, such outlines being arranged in a series transverse of the sheet, with the series succeeding one another along the sheet from end to end. About the throat of each upper is customarily a raised bead, which furnishes a finish for this portion of the completed shoe. Taking the successive sheets from a pile of trays in which they are brought to him, the cutter lays them upon his table, and cuts out each upper under the guidance of the outline thereon and along the edge of the bead. The uppers are laid one by one by the operator upon the leaves of a receiving device, called a book, and the sheet of scrap-material falls upon the floor. This practice requires much space and labor for the handling of the material before and after cutting, and the operation is necessarily slow, with considerable waste where the designs are divided at the ends of the sheets. The present invention has as an object the provision of a machine by which the work-pieces may be cut and delivered, as to a booking device, rapidly and economically with little handling of the stock, the cut pieces and the scrap, and with a reduction in the area required for the operations.

As a feature of the invention, I have combined with a movable cutting die and means for advancing the stock during the cutting movement of the die, a gage, as a plate provided with a sight-opening beneath which the stock travels, and means whereby the operator may control the movement of the die in accordance with this indication. The area within which the die is to cut is thus determined with sufficient accuracy, as by viewing a portion of the embossed design through the sight-opening, and the entire outline of one or more of the uppers is cut by a single opera-

tion of the machine. I prefer to produce the advance of the stock, regardless of how its position for the operation is determined, by a conveyor, and this preferably also furnishes the surface upon which the die cuts. With the conveyor there are shown associated a reel arranged to supply the stock, together with a separator which prevents the successive convolutions of said stock from adhesion, and a reel which receives the separator and coils it while the stock is delivered to the conveyor. Said stock is thus maintained in compact form for most efficient operation. While the sheet-material is being advanced to the die from the reel or other source of supply, I prefer to subject it to the action of movable means tending to draw it laterally and to cause its advance. For this purpose, I have shown a pair of rotatable cylindrical brushes inclined rearwardly from the longitudinal axis of the advancing stock. Under certain conditions, as when the material is to be cut to a design which it bears, it may be desirable to compensate for irregularities in its transverse position, and for this purpose I have included in the apparatus means arranged for manipulation by the operator to adjust the stock and die relatively in this direction. The die may be mounted to move upon its support by means of a carriage, which the operator shifts, as by a hand-lever, to correspond to the design, or to otherwise determine the area to be operated upon.

The pieces having been cut from the stock by the die or other mechanism, they are to be arranged in an orderly manner, protected from adhesion, and a convenient disposition made of the scrap. In this connection, as a further feature of the invention, there is combined with the conveyor which advances the stock from the cutting mechanism, means arranged to elevate the scrap above the conveyor. I have found desirable for this purpose opposed belts having their adjacent runs traveling together and arranged to receive the sheet scrap between them. One of these belts may be utilized to remove the scrap from the machine, being extended at one side of its upward path. The pieces of died-out stock are separated from

the conveyor upon which the cutting is effected by a rotatable member, as a brush. With this brush, I prefer to associate means to deflect the thus separated pieces away from the conveyor, preventing them from doubling back upon themselves. In the present instance, endless deflecting members are employed, which are inclined from the conveyor above the brush. The work-pieces freed from the conveyor are delivered over a stationary table, which may be a support for a receiving book. Reciprocating beneath the conveyor and above the table is a delivery device movable away from the conveyor during the reception by said delivery device of cut pieces and toward the conveyor during their delivery. This device may consist of a frame, upon which are movable endless members arranged to receive the cut pieces from the conveyor during the advance of the work therefrom. The frame and endless members are caused to move relatively to discharge the piece, as by holding the members against movement during the rearward travel of the frame. By this organization, the sticky and flaccid cut pieces of rubber may be transferred from the surface of the traveling conveyor at one level to the stationary receiving book at another, without danger of being folded upon themselves and caused to adhere, since, during such transfer from one surface to another, there are always exerted forces tending to maintain them extended. This delivery mechanism, to act properly upon the cut pieces, may be timed in its movement to correspond to their receipt, and therefore with the cutting mechanism, which is variable in its operation. This result I attain by operating the delivery mechanism under the control of the cutting mechanism. The specific operating means which I have illustrated includes a movable series of normally inactive members, as pins mounted upon a wheel, together with means made effective upon the operation of the cutting mechanism for setting one of the series in active position, this set member, in turn, controlling the operation of the delivery mechanism. Said delivery mechanism is consequently caused to act in synchronism with the supply of the pieces to it.

A single embodiment of my invention is shown in the accompanying drawings, in which

Figs. 1 and 2, taken together, illustrate the apparatus in broken side elevation, these views overlapping somewhat;

Fig. 3 is a broken top plan view of the stock-supplying and cutting portion of the apparatus;

Fig. 4 is a similar view of the delivery-portion;

Fig. 5 is an enlarged vertical section on the line V—V of Fig. 4;

Fig. 6 illustrates in perspective a portion

of the means for mounting and adjusting the dies;

Fig. 7 is an enlarged vertical section on the line VII—VII of Fig. 4;

Fig. 8 is a detail in elevation of the wheel for controlling the delivery mechanism; and

Fig. 9 is a partial enlarged horizontal section through the axis of the wheel.

At the receiving end of the machine is a frame 10 for supporting a coil of sheet rubber-stock to be operated upon, this coil preferably being in the form of the package described and claimed in the application filed in my name on the same date as the present application. The package-coil includes a reel 12, about the core of which are wound alternate convolutions of the sheet-rubber R in the form of an elongated strip or web, and a separator-web S. This separator preferably has spaced belts 14 at its side edges, joined by stiffening bars 16, there being between the belts and bars a stock-supporting surface furnished by a web 18 of relatively thin fabric. When the separator is wound upon the reel, the distance between the belts and between the inner surface of the fabric 18 and the opposed outer sides of the bars is such that there is formed a spiral space, in which the web of rubber may rest without pressure upon it, save its own weight, and with its convolutions entirely independent of one another. There is consequently no danger of stock becoming defaced or of portions sticking together. The heads of the reel 12 rest upon grooved rolls 20 journaled upon the frame 10, so it may rotate readily. At the lower portion of the frame, similarly carried upon rolls 22, is a receiving reel 24. To this receiving reel, the end of the separator S is attached and is wound upon it. The stock and separator are drawn off by carrying the latter between feed-rolls 26, 26, one of which may be yieldable. These rolls are journaled horizontally upon the frame 10, geared together at 28, and driven by sprocket-gearing 30 from a roll 32 rotatable upon a connection between the frame 10 and a second frame 34, which continues the apparatus. The reel 24 is rotated by sprocket-gearing 36 from one of the rolls 26, the rotating force being applied to the supporting rolls 22 and for the maximum speed required. For less speed, the driven rolls may slip beneath the reel-head. In starting the operation upon a package of the material, the end of the stock freed from the separator is laid upon an endless conveyor 38, which may be of rubberized canvas, supported at its extremities by the roll 32 and by a roll 40 journaled horizontally at the opposite side of the frame. Below its upper operating run, the conveyor 38 is guided along the desired path by various rolls 44 turning upon the frame 34. It is driven at a relatively slow speed to advance the web of rubber resting upon it, by a roll

46 rotatable in standards 48, and receiving power through sprocket-gearing 50 from a main drive-shaft 52.

Between the rolls 32 and 40, and additionally supported by rolls 54, 54, the conveyor 38 travels over a bed 56 of a dieing-out mechanism D. Generally, this mechanism may be of any suitable form, there being carried for vertical reciprocation upon the frame 34, in the illustrated mechanism, a supporting head or beam 58, guided at its opposite extremities by rods 60. Journaled below the bed is a transverse shaft 62, having, near its ends, eccentrics 64 joined by eccentric-rods 66 to the rods carrying the beam. Through a single-rotation clutch, indicated at 68, the shaft 62 is connected by belt-gearing 70 to a motor 72 mounted upon the top of the frame. Engagement of the clutch and the resulting operation of the beam may be controlled by the operator through a treadle 73. Upon the beam are carried the cutting dies 74, of which there are three shown. To aid the operator in determining when the mechanism D shall be started by the treadle 73 to make the cut, a gage is provided, this consisting of a bar 75 extending transversely above the conveyor at the rear of the bed 56. In this bar is an elongated opening, through which may be seen a portion of an area of the stock to be cut preceding that which is beneath the dies. Each of these areas may bear a series of designs embossed upon the rubber during the calendering process, they being shown in the present instance at U as having the outline of shoe-uppers. When there is visible through the sight-opening of the bar 75 a predetermined portion of the designs, this will indicate to the operator that the designs in advance are in correct alinement with the dies, and he therefore produces engagement of the clutch 68 by depressing the treadle 73. Since the cutting movement of the die is at a high rate as compared with the travel of the stock upon the conveyor 38, the cutting is effectively accomplished without discontinuing this travel. To permit the relation between the gage-bar and the dies to be varied, so that the indication afforded through the sight-opening may be accurate, said bar is adjustably mounted upon the frame by slot-and-screw connections 76.

It may be desirable to attain more accurate determination of the areas to be cut than is furnished by an uncontrolled transverse relation between the dies upon the beam and the stock advancing below it upon the conveyor. Irregularities in the web of rubber or in its travel may exist. To correct such conditions, the dies 74 are fixed upon a carriage 78 arranged to slide upon the beam. I have shown this carriage as provided with upstanding projections 80, upon which are mounted rolls 82 traveling upon finished surfaces 84 at each transverse

edge of the beam. A lever 86 is fulcrumed upon the under side of the beam, and is joined by a link 88 to the carriage. The operator, holding the lever 86, watches the relation of the advancing stock to some index or gaging means, as a projection 87 from the carriage. If the designs are seen to move laterally out of alinement with the dies as shown by this projection, he shifts the carriage to compensate for this before he produces the cutting movement of the beam through the treadle 73. In this way, the cuts may be made in correct relation to the designs, regardless of the transverse position of the stock.

To present the stock upon the conveyor smoothly for the dieing-out operation, there are arranged to rotate upon a bracket on the frame 34, between the unreeling mechanism and the dieing-out mechanism, two brushes 90, 90. These are inclined somewhat with respect to the longitudinal axis of the conveyor, their own axes converging in the direction of travel of the web of stock. They are connected at 92 by a universal joint, and are rotated by belt-gearing 94 from one of the rolls 44 in a direction to aid the advance of the stock by their frictional engagement with it. On account of their inclined relation, there will be a component of the force exerted by them which will act transversely of the stock, tending to draw it out and remove wrinkles and fulled portions.

After receiving the action of the dies 74, the stock continues its travel, the cut pieces P adhering to the conveyor 38, while the sheet of scrap from which the uppers have been taken is led away by an elevating device E. This may be in the form of two belts 96 and 98, the width of which is substantially that of the stock and having their adjacent substantially vertical runs rising above the mechanism D. Initially for each package of stock operated upon, the forward end, after passing the cutting mechanism, is led upwardly by the operator between these belts. Rolls 100, which guide the lower extremities of the belts, may be geared together at 102 and rotated to drive said belts by sprocket-gearing 104 connected to one of the rolls 44. By this belt mechanism, there is exerted across the entire width of the web an elevating force, which separates the scrap from the cut pieces without displacing them laterally upon the conveyor and thus disturbing their relation for delivery. The upper portion of the belt 96 may be led back over rolls 106, 106 in an approximately horizontal direction to any desired point, as a conveyor for the web of scrap, this being rolled or otherwise disposed of. The belt 98 is shown at its upper extremity as passing about a roll 108, so located that this belt is bent back over its companion to insure the movement of the scrap in the desired direction.

Beyond the frame 34 is a frame 109 of

delivering or positioning mechanism F. The cut pieces are received from the conveyor 38 upon downwardly inclined tapes or endless conveying members 110 passing over rolls 112 and 114 journaled transversely of the frame 109, the former being driven from the shaft 52 by way of sprocket-gearing 116, a counter-shaft 118 and sprocket-gearing 120. Since the work tends to adhere to the conveyor, against which it has been forced by the dies, I provide means for disengaging the cut pieces therefrom, consisting of a peripheral series of brush-fibers projecting from the roll 112 between the tapes 110. The rotation of the roll 112 causes the ends of these fibers to move upwardly in contact with the adjacent extremity of the conveyor 38, and, as the pieces reach them, these are separated from the conveyor and carried over the brush upon the tapes 110. As the lifting action of the fibers might turn the work back and double it upon itself, there is associated with the brush a deflector, having tapes 122 operating over a small roll 124 situated between the conveyor 38 and the brush 112, and a larger upper roll 126, both these rolls being carried transversely of the frame 109. The roll 126 is so located that the forward runs of the tapes are inclined over the brush. These deflecting tapes are driven in the direction of the arrow in Fig. 7 through belt-gearing 128 to a counter-shaft 130, and like gearing 132 to a shaft 134. The shaft 134 is rotated from the power-shaft 52 through sprocket-gearing 136, and has another function which will appear later. When the brush-fibers raise the ends of the work-pieces from the conveyor 38, they are carried against the tapes 122, which hold them from rearward movement, and deflect them forward upon the tapes 110.

At the forward end of the frame 109 is a table 138, upon which is supported a receiving device, which may consist of a book 140. This book is made up of a plurality of leaves of fabric, bound together at one edge, the leaves receiving between them the cut pieces, and separating them from one another. Since the pieces of rubber are both sticky and flaccid, it is necessary to exert upon them, as they lie upon a traveling conveying surface, a force which will tend to draw them off, restraining their forward extremities from following said conveying surface. To accomplish this, the following organization is highly effective. Upon horizontal rails 142 at the sides of the frame 109 moves a delivery-frame 144, supported by rolls 146. At the opposite extremities of the delivery-frame are journaled transversely extended rolls 148, 148, over which operate endless members or tapes 150, these being disposed between the tapes 110. The frame is reciprocated from the shaft 134 through a single-rotation clutch mechanism 152 operating a

crank 154 linked at 156 to a lever 158, which is, in turn, joined to the frame 144 by a link 160. The frame is thereby moved from a point at which the forward ends of the tapes 150 are in proximity to the lower extremities of the tapes 110, outwardly until the frame is above the table 138. Its reciprocation is so timed that it is in the position first mentioned when a series of the cut pieces reach the bottom-portion of the tapes 110. It then starts upon its outward movement, and, as the travel of the tapes 110 carries the forward ends of the pieces upon the tapes 150, these draw the pieces away from the roll 114, and prevent the work from being carried back beneath it. To remove the work from the tapes 150 as the frame is caused to return from its extreme forward position, a relative movement between said tapes and the delivering frame is produced. Near the center of the extremes of movement of the frame is a device for clamping the tapes so they may be held stationary while the frame retreats. Pivoted above the upper run of the tapes 150 is a bar 162, upon which is fixed a series of yieldable contact-fingers 164, one for each of the tapes. A rounded end of each spring is arranged for engagement with the corresponding tape upon oscillation of the bar. A spring 166, attached to the stationary frame 109 and to an arm 168 projecting from the bar 162, serves to bring about this contact of the fingers with the tapes, the latter being pressed against a stationary abutment-surface 170. This clamping movement may be prevented by a latch 172 pivoted upon the abutment at one end of the bar, and drawn by a spring 174 into contact with a projection 176 from said bar. The arm 168 carries a setting member in the form of a roll 177. Considering the delivering frame to be in its inner position, ready to receive work from the tapes 110, the bar 162 is at this time latched at 172, so that the fingers 164 are raised from the tapes. Therefore, as the frame moves forward, drawing the pieces from the tapes 110, the receiving tapes 150 are without movement upon their supporting rolls. Just before the frame reaches its outward extreme of travel, a depending portion of the latch 172 is struck by a projection 178 from the frame 144. This disengages the latch from the projection 176, so the bar is turned on its pivots by the spring 166, bringing the clamping fingers against the tapes 150. Now, as the frame 144 returns to its initial position, a relative movement is produced between the tapes and their supporting frame, the former remaining at rest while the frame travels. Consequently, the pieces supported upon the tapes are displaced, the frame retreating from beneath them. As the ends of the work-pieces reach the leaf of the book 140 by which they are to be received, there is exerted a slight rearward pull, which prevents the ends of the pieces from being

doubled. They are therefore smoothly deposited upon the leaf. Just before the frame 144 reaches its initial position, a cam member 179, which it carries, contacts with the roll 177, raising the arm 168 and turning the bar 162 upon its pivots until it is again latched at 172. The springs 164 are thus held raised until the next delivering operation.

It is necessary that the delivering device operate in correct time-relation with respect to the pieces cut by the dies. That is, after a series of uppers have been formed by the dies from the sheet of stock and have traveled along the extremity of the conveyor 38 and down the tapes 110, they must find the delivering frame with its tapes at its inner position ready to receive them. To insure this, I operate the clutch 152 under the control of the die mechanism. Upon the shaft 62, from which the dies are operated, is a cam 180, which rotates once for each cutting operation. In this rotation, it brings a projection into engagement with a spring-actuated plunger 182 mounted to reciprocate horizontally upon the frame 34. Rotatable about an axis parallel to the direction of movement of the plunger is a wheel 184 driven by sprocket-gearing 186 from the spindle of the roll 46 in a definite time-relation to the travel of the cut pieces between the dies and the delivering frame. Spaced uniformly at frequent intervals about the wheel, near its periphery, is a series of horizontal sliding pins 188, which move successively into alignment with the plunger. In their normal inactive position, the pins pass idly a bell-crank lever 190, which is fulcrumed on a bracket projecting from the end of the frame 109. A link 192 joins the lever 190 to a second bell-crank lever 194 fulcrumed upon the frame, and this lever is united through a link 196 to a lever 198, which causes the engagement of the clutch 152. As the dies cut the stock, the high portion of the cam 180 reaches and forces out the plunger 182, which contacts with one of the pins 188, which it causes to project beyond the outer face of the wheel. The plunger is then released by the cam, so that it returns to its normal position. When the series of work-pieces have arrived at the delivery-end of the tapes 110, the pin 188, thus set, will have reached the lever 190 with which it now contacts, and, turning upon its fulcrum, will, through its connections, cause a single engagement of the clutch 152. There is thereby produced the delivering reciprocation of the frame 144, as already described. After the set pin leaves the lever 190, it encounters an incline upon a cam member 200, which forces it back to its normal position.

To briefly outline the general operation of the apparatus, a package-coil of the rubber-stock and separator is placed at the top of the frame 10, and the separator connected to an empty reel 24 at the bottom of the

frame. As this separator is uncoiled by power applied to the feed-rolls 26, 26, the end of the rubber-stock is led forward upon the conveyor 38 beneath the brushes 90. The conveyor, aided by the brushes, advances the stock, said brushes at the same time putting it under some lateral tension, so that it lies smoothly upon the conveyor. As the upper-designs U, which may be embossed upon the material, reach the dies 74, the operator, if necessary, adjusts these dies into the correct transverse position by means of the lever 86, and when the determined points upon the succeeding designs arrive at the sight-opening in the bar 75, he trips the clutch 68 by lowering the treadle 73. The dies are therefore caused to descend rapidly, while the stock is still traveling, cutting the pieces P from it in accordance with the outline of the designs. The end of the sheet from which the pieces have been formed being introduced between adjacent surfaces of the belts 96 and 98, these produce a direct lifting force upon the stock, removing it from the conveyor, to which the cut pieces are left adhering. Directed by the overhang of the conveyor 98 upon the conveyor 96, the latter carries the web of scrap away from the machine. Reaching the forward end of the conveyor 38, the work-pieces are separated therefrom by the brush 112, and are deflected down upon the tapes 110 by the inclined tapes 122. When the series of cut pieces reach the lower extremities of the tapes 110, the delivering frame 144 is at its inner position. It is started for its delivering movement by the action of the cam 180 timed by the dieing-out mechanism and in synchronism therewith. As it moves forward, it draws off the pieces from the tapes 110, and maintains them flat, and, upon arriving over the table 138 releases the fingers 164 from their latches. These fingers clamp the delivery-tapes upon the abutment 170, producing a relative movement between the frame and tapes during the inward travel of the former, and delivering the work-pieces upon the book 140 held by the table, while at the same time imparting a straightening force to the pieces, which are thus laid smoothly upon a leaf of the book. Near the opposite extreme of its travel, the clamping springs are reset by engagement with the roll 178 of the cam-surface upon the frame. The series of cut uppers are thus successively delivered between the leaves, which are turned to receive them by an attendant. If waste occurs because of divided terminal designs, it is limited to two at the ends of the long web, which may equal many of the usual strips. The stock having been all drawn from the reel 12 and the separator coiled upon the reel 24, these reels are removed from the frame 10, the former being replaced by a new package, and the latter utilized in the formation of such a package.

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

1. In a machine for cutting sheet-stock, the combination with a movable cutting die, of means for continuously advancing the stock into operative relation to the die, a gage for determining the advance of the stock, and means under the control of the operator for governing the movement of the die in accordance with the relation of the stock to the gage.

2. In a machine for cutting sheet-stock, the combination with a reciprocatory cutting die, of operating mechanism for the die including a clutch, a conveyor for the stock traveling beneath the die, a gage situated above the conveyor, and means actuated by the operator to shift the clutch at a time determined by the relation between the stock and gage.

3. In a machine for cutting sheet-rubber stock in accordance with a design thereon, the combination with a reciprocatory cutting die, operating mechanism for the die, a conveyor-belt upon which the stock is advanced to receive the operation of the die, a plate situated in proximity to the conveying surface of the belt and having an opening through which may be seen the design upon the stock, and means under the control of the operator for governing the die-operating mechanism.

4. In a machine for cutting sheet-stock, the combination with a conveyor arranged to advance the stock and to furnish a surface upon which said stock is cut, of a reciprocatory cutting die maintained against movement in the direction of travel of the conveyor, and means for advancing the conveyor and stock continuously during the action of the die.

5. In a machine for cutting sheet-rubber stock, a movable die, means for supplying stock to the die, and movable means situated between the supplying means and die and tending in its movement to advance the stock toward the die and to draw it laterally.

6. In a machine for cutting sheet-rubber stock, a movable die, means for supplying stock to the die, rotatable rolls having their axes converging in the direction of travel of the stock and their peripheries contacting with said stock, and means for rotating the rolls to exert an advancing effect upon the stock.

7. In a machine for cutting sheet-rubber stock, a movable die, means for supplying stock to the die, a pair of rotatable cylindrical brushes inclined rearwardly from points near the longitudinal axis of the advancing stock, and means for rotating the brushes in contact with the stock.

8. In a machine for cutting sheet-rubber stock, a reel arranged to support the stock and a separator, a conveyor arranged to receive and advance the stock, a reel arranged to receive the separator, means for rotating the

receiving reel and coiling the separator thereon while the stock is delivered to the conveyor, means for cutting the stock advanced by the conveyor, and movable means situated above the conveyor between the supply-reel and cutting means and tending in its movement to advance the stock toward the cutting means.

9. In a machine for cutting sheet-rubber stock, a reel arranged to support the stock and a separator, a conveyor arranged to receive and advance the stock, a reel arranged to receive the separator, means for rotating the receiving reel and coiling the separator thereon while the stock is delivered to the conveyor, a die movable toward the conveyor to cut the stock thereon, and oppositely inclined rotatable brushes acting upon the stock above the conveyor and between the supply-reel and die.

10. In a machine for cutting sheet-stock, the combination with means for advancing the stock, of a support reciprocating toward and from the advancing means, a series of cutting dies extending transversely of the stock and mounted to move upon the support, and means arranged for manipulation by the operator for effecting relative movement of the stock and dies transversely of the direction of advance of said stock.

11. In a machine for cutting sheet-rubber stock in accordance with a design thereon, the combination with means for advancing the stock, of a support reciprocating toward and from the advancing means, a cutting die mounted to move upon the support, a gage movable with the die for determining the relation of the stock to the die, and means connected to the die and arranged for manipulation by the operator to shift said die upon the support under the guidance of the gage to correspond to the design of the advancing stock.

12. In a machine for cutting sheet-rubber stock in accordance with a design thereon, the combination with means for advancing the stock, a reciprocatory head movable above the advancing means, a carriage movable upon the head, a die fixed upon the carriage, and a hand-lever fulcrumed upon the head and connected to the carriage.

13. In a machine for cutting sheet-rubber stock in accordance with a design thereon, the combination with means for advancing the stock, of a gage situated above the advancing means, a support reciprocating toward and from the advancing means, means under the control of the operator for governing each reciprocation of the support at a time determined by the relation between the stock and gage, a cutting die mounted to move upon the support, a gage movable with the die for indicating the relation of the stock to the die, and means arranged for manipulation by the operator to shift said die under

the guidance of the last-mentioned gage to correspond to the design of the advancing stock.

14. In a machine for cutting sheet-rubber stock in accordance with a design thereon, the combination with means for advancing the stock, a reciprocatory head movable above the advancing means, mechanism including a clutch for reciprocating the head, a treadle by which the clutch is governed, a carriage movable upon the head, a die fixed upon the carriage, and a hand-lever fulcrumed upon the head and connected to the carriage.

15. In a machine for cutting sheet-stock, cutting mechanism, a conveyor arranged to move the stock to and from the cutting mechanism, and opposite belts having adjacent runs traveling together and arranged to receive between them sheet-scrap resulting from the cutting operation, the cut objects remaining upon the conveyor.

16. In a machine for cutting sheet-stock, cutting mechanism, a conveyor arranged to move the stock to and from the cutting mechanism, and opposite belts rising above the conveyor and having adjacent runs traveling together and arranged to receive between them sheet-scrap resulting from the cutting operation, one of said belts being extended to one side of its upward path for conveying scrap from the machine.

17. In a machine for cutting sheet-stock, cutting mechanism, a conveyor arranged to move the stock to and from the cutting mechanism, and opposite belts rising above the conveyor in a substantially vertical direction and having adjacent runs traveling together and arranged to receive between them sheet-scrap resulting from the cutting operation, one of the said belts terminating in a generally horizontal run and the associated belt extending over its companion at the point of change of direction.

18. In a machine for cutting sheet-rubber stock, a reciprocatory die, a conveyor providing a cutting surface for the die, and a rotatable member arranged to contact with the cut pieces forced by the die against the conveyor and separate them from said conveyor.

19. In a machine for cutting sheet-rubber stock, a reciprocatory die, a conveyor providing a cutting surface for the die, a rotatable member arranged to contact with the cut pieces forced by the die against the conveyor and separate them from said conveyor, and rotatable means arranged to deflect the thus-separated pieces away from the conveyor.

20. In a machine for cutting sheet-rubber stock, a reciprocatory die, a conveyor providing a cutting surface for the die, a brush having fibers arranged in peripheral rows spaced from one another and arranged to

contact with cut pieces upon the conveyor, and conveyors operating between the rows.

21. In a machine for cutting sheet-rubber stock, a reciprocatory die, a conveyor providing a cutting surface for the die, a brush having fibers arranged in peripheral rows spaced from one another and arranged to contact with cut pieces upon the conveyor, conveyors operating between the rows, and endless deflecting members inclined from the end of the cutting conveyor above the brush.

22. In a machine for cutting sheet-rubber stock, the combination with cutting mechanism, of a conveyor for the cut pieces of rubber, a stationary table, a frame arranged to reciprocate beneath the conveyor and above the table, endless members carried by the frame and arranged to receive a cut piece from the conveyor during the advance of the frame therefrom, and means for causing the frame and endless members to move relatively to discharge the piece.

23. In a machine for cutting sheet-rubber stock, the combination with cutting mechanism, of a conveyor for the cut pieces of rubber, a stationary table, a frame arranged to reciprocate beneath the conveyor and above the table, endless members carried by the frame and arranged to receive cut pieces from the conveyor during the advance of the frame therefrom, and means for holding the endless members against movement during the rearward travel of the frame.

24. In a machine for cutting sheet-rubber stock, the combination with cutting mechanism, of a conveyor for the cut pieces of rubber, a book-support, a frame arranged to reciprocate beneath the conveyor and above the support, tapes carried by the frame and arranged to receive a cut piece from the conveyor during the advance of the frame therefrom, and means for clamping the tapes against movement when the frame is above the book-support.

25. In a machine for cutting sheet-stock, the combination with cutting mechanism, of delivering mechanism for the cut pieces, a movable series of normally inactive members, means made effective in the operation of the cutting mechanism for setting one of the series of members in active position, and means controlled by the set member for operating the delivering mechanism.

26. In a machine for cutting sheet-stock, the combination with cutting mechanism, of delivering mechanism for the cut pieces, a movable series of normally inactive members, means made effective in the operation of the cutting mechanism for setting one of the series of members in active position, means controlled by the set member for operating the delivering mechanism, and means for returning the set member to its inactive position.

27. In a machine for cutting sheet-stock, the combination with cutting mechanism, of de-

livering mechanism for the cut pieces, a rotatable wheel, a series of pins movable upon the wheel, means for setting one of the pins of the series upon operation of the cutting mechanism, means including a clutch for operating the delivering mechanism, and connections controlled by the set pin for actuating the clutch.

28. In a machine for cutting sheet-stock, the combination with cutting mechanism, of delivering mechanism for the cut pieces, a rotatable wheel, a series of pins movable upon the wheel, means for setting one of the pins of the series upon operation of the cutting mechanism, means including a clutch for operating the delivering mechanism, connections controlled by the set pin for actuating the clutch, and a fixed cam with which the set pin contacts for return to its normal position.

29. In a machine for cutting sheet-rubber stock, the combination with cutting mechanism, of a conveyor for the cut pieces of rubber, a stationary table, a frame arranged to reciprocate beneath the conveyor and above the table, endless members carried by the frame and arranged to receive cut pieces from the conveyor during the advance of the frame therefrom, means for causing the frame and endless members to move relatively to discharge the pieces, means including a clutch for reciprocating the frame, and means under the control of the cutting mechanism for actuating the clutch.

30. In a machine for cutting sheet-rubber stock, the combination with cutting mechanism, of a conveyor for cut pieces of rubber, a delivering device movable beneath the end of the conveyor, and means operable in timed relation to the cutting mechanism for moving the delivering device away from the conveyor during the reception from said conveyor of the cut pieces and toward the conveyor during the delivery of the pieces by the device.

In testimony whereof I have signed my name to this specification.

ERNEST W. STACEY.

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