Feb. 20, 1962 K. BLANZ 3,021,999

MACHINE FOR CUTTING PATTERNS FROM WEBS OF TEXTILE MATERIAL

Filed Oct. 14, 1959 7 Sheets-Sheet 1

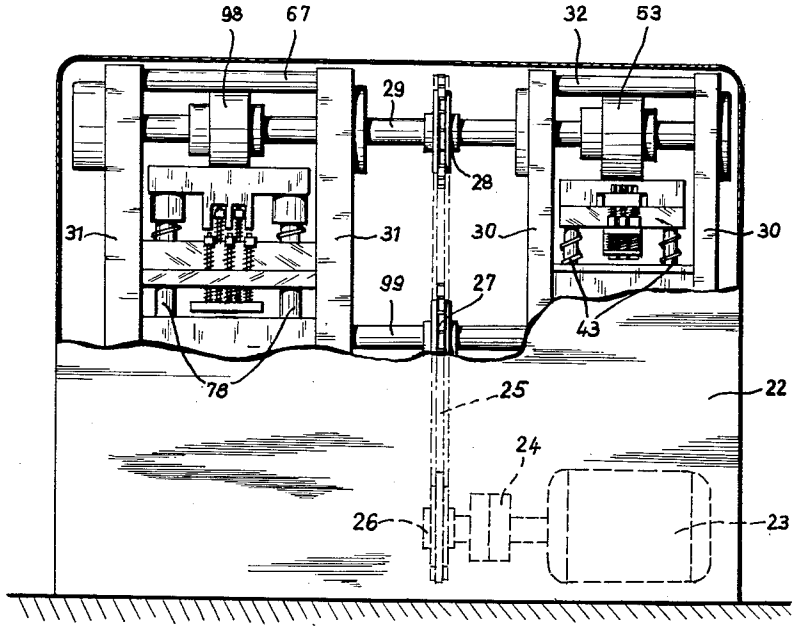


FIG. 1

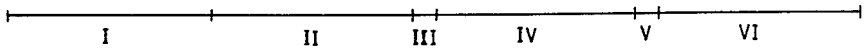


FIG. 11

Feb. 20, 1962 K. BLANZ 3,021,999

MACHINE FOR CUTTING PATTERNS FROM WEBS OF TEXTILE MATERIAL

Filed Oct. 14, 1959 7 Sheets-Sheet 2

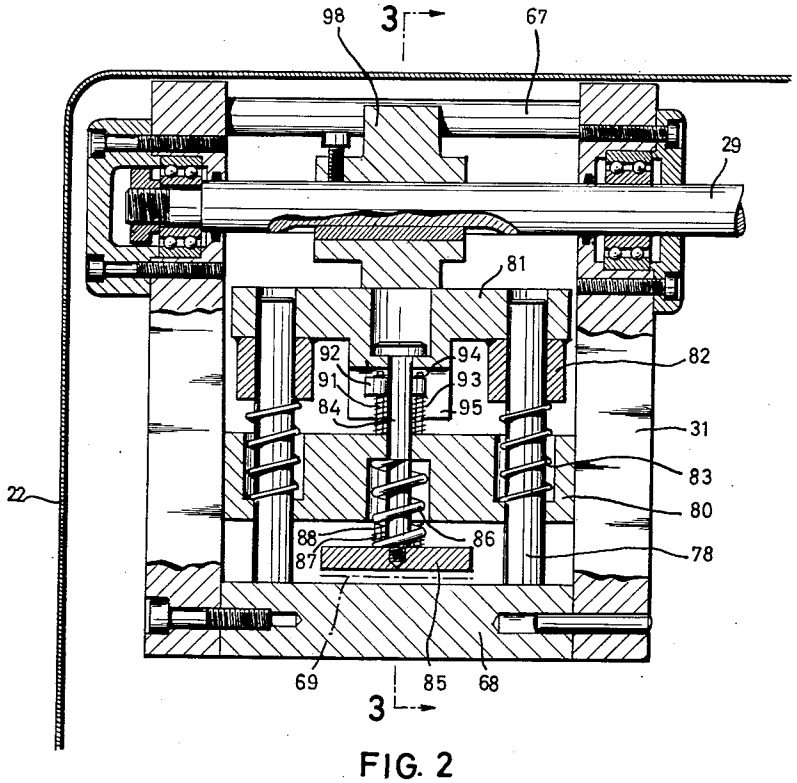


FIG. 2

Feb. 20, 1962 K. BLANZ 3,021,999

MACHINE FOR CUTTING PATTERNS FROM WEBS OF TEXTILE MATERIAL

Filed Oct. 14, 1959 7 Sheets-Sheet 3

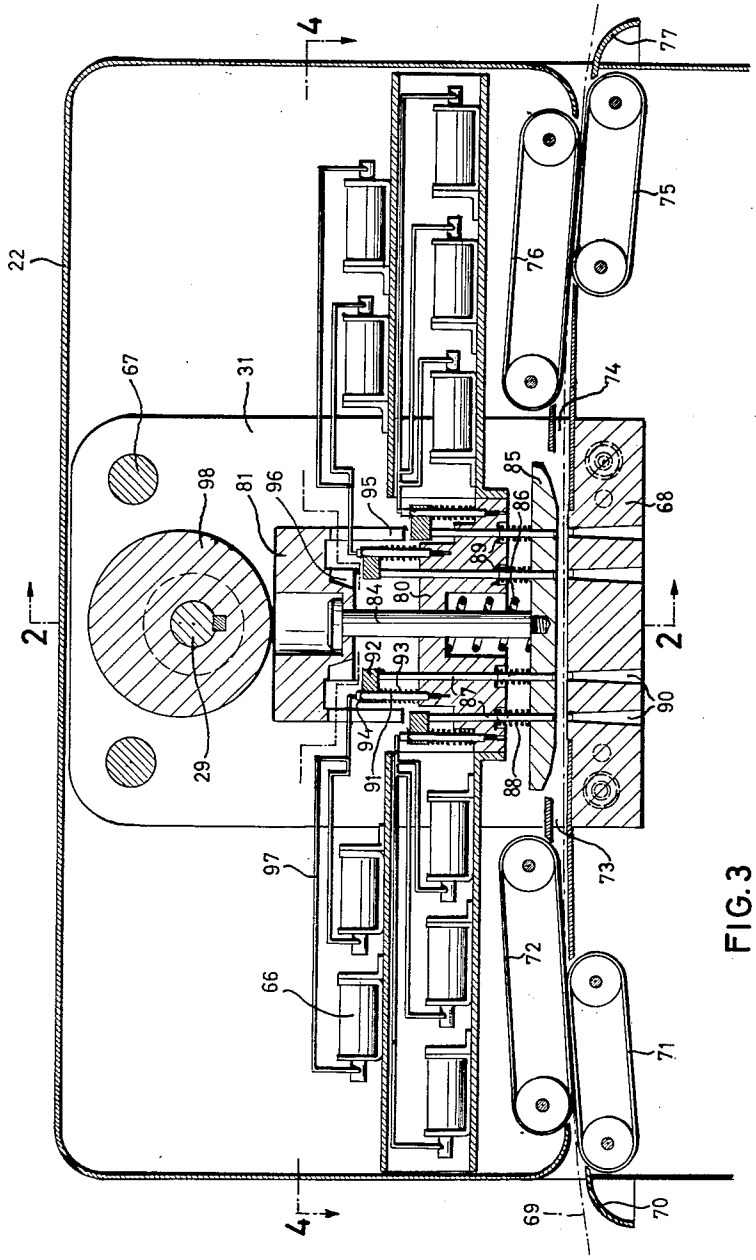


FIG. 3

Feb. 20, 1962 K. BLANZ 3,021,999

MACHINE FOR CUTTING PATTERNS FROM WEBS OF TEXTILE MATERIAL

Filed Oct. 14, 1959 7 Sheets-Sheet 4

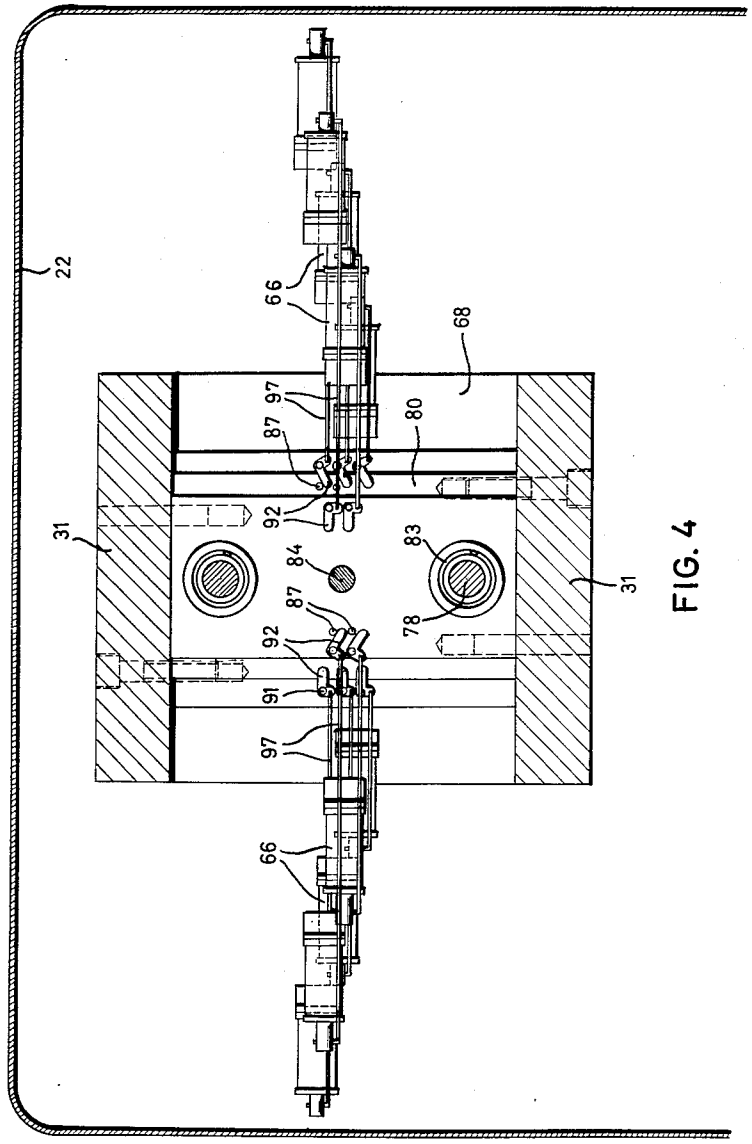


FIG. 4

Feb. 20, 1962 K. BLANZ 3,021,999

MACHINE FOR CUTTING PATTERNS FROM WEBS OF TEXTILE MATERIAL

Filed Oct. 14, 1959 7 Sheets-Sheet 5

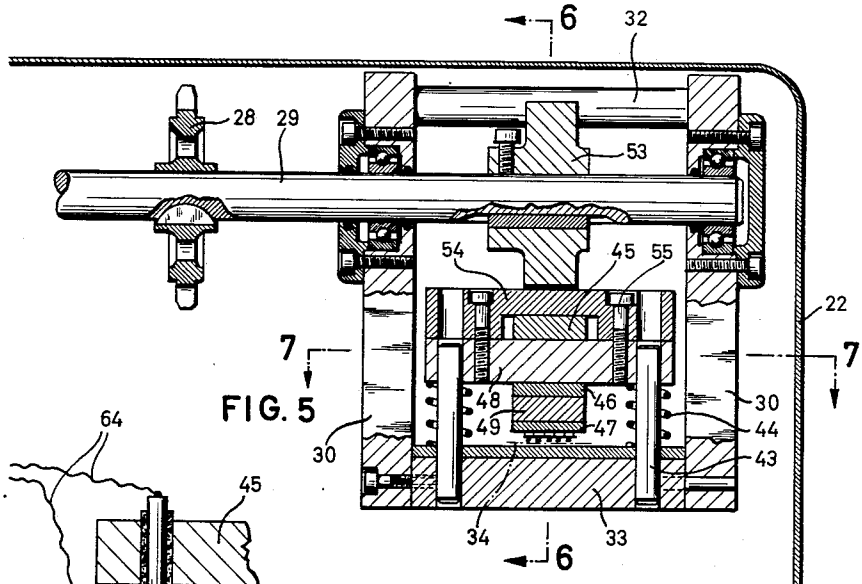


FIG. 5

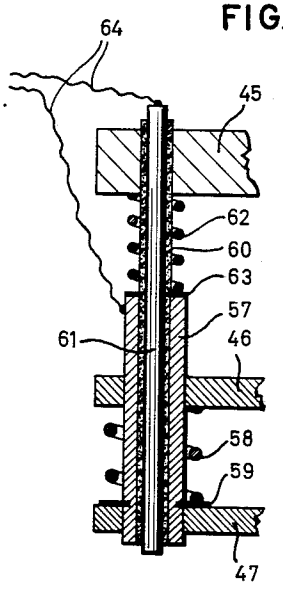


FIG. 8

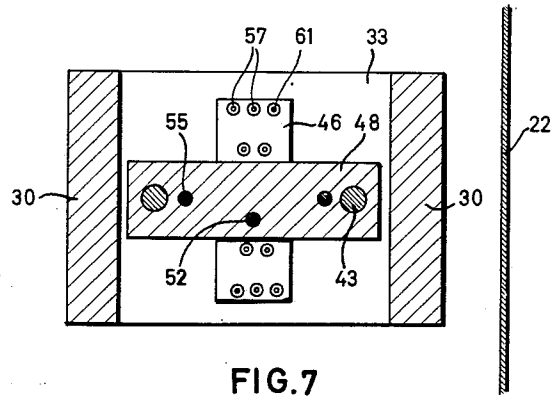


FIG. 7

Feb. 20, 1962 K. BLANZ 3,021,999

MACHINE FOR CUTTING PATTERNS FROM WEBS OF TEXTILE MATERIAL

Filed Oct. 14, 1959 7 Sheets-Sheet 6

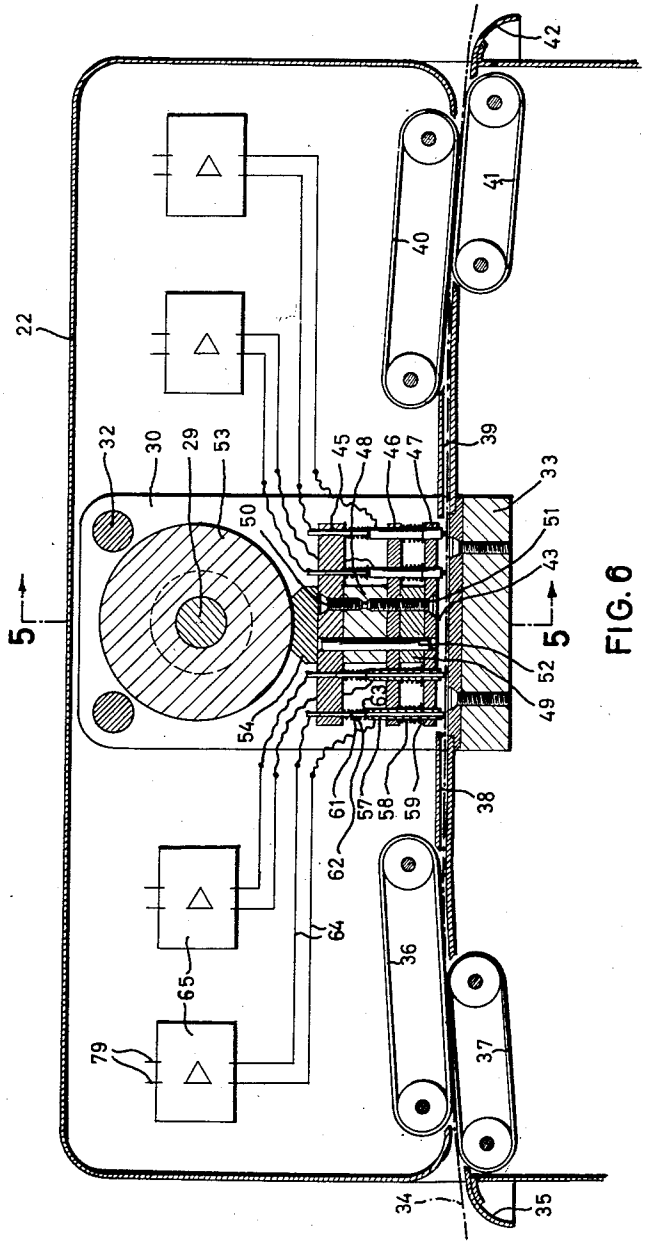


FIG. 6

Feb. 20, 1962 K. BLANZ 3,021,999

MACHINE FOR CUTTING PATTERNS FROM WEBS OF TEXTILE MATERIAL

Filed Oct. 14, 1959 7 Sheets-Sheet 7

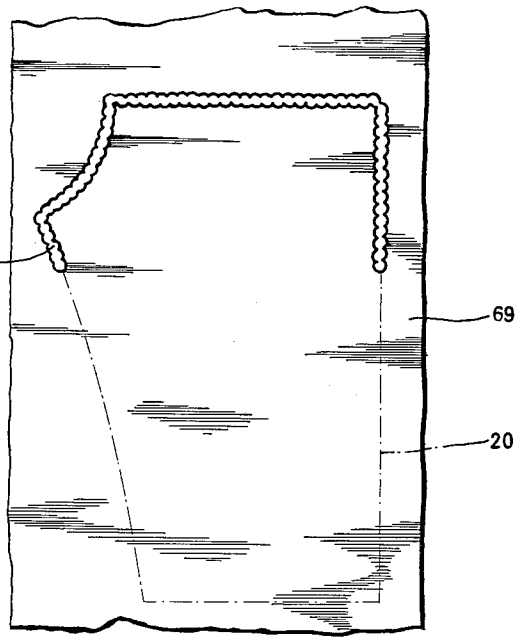
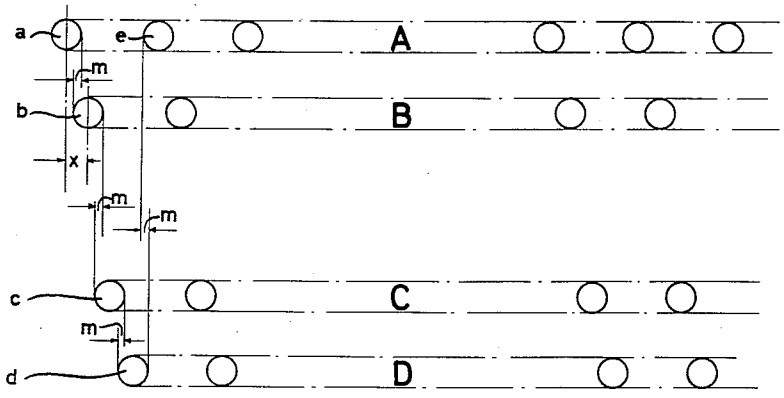


FIG. 9

Q →

FIG. 10



United States Patent Office 3,021,999
Patented Feb. 20, 1962

3,021,999

MACHINE FOR CUTTING PATTERNS FROM WEBS OF TEXTILE MATERIAL

Kurt Blanz, Stuttgart, Germany, assignor to Krauss & Reichert, Spezialmaschinenfabrik und Apparatebau, Fellbach, Wurttemberg, Germany

Filed Oct. 14, 1959, Ser. No. 846,407
Claims priority, application Germany Oct. 16, 1958
12 Claims. (Cl. 234—87)

This invention relates in general to textile cutting machines and particularly to a new and useful machine for cutting patterns from webs of textile material.

The present invention is particularly concerned with a machine of this type with which patterns are cut either from a single piece of web material or a pile of superposed webs of material, such as in the case where the patterns are for a plurality of similar pattern items, such as readymade suits. In those cases where a pile of fabrics is cut, difficulty has been encountered in achieving devices for both initial piling and controlling of the piles of materials during cutting, and for making up the staples of material for cutting. The cutting of the pattern from a pile, or staple, requires a lot of skill and considerable time. An important disadvantage in the present day automatic machines for cutting material of this nature is that the cutting implement must be arranged so that there is sufficient distance between the patterns being traced on the uppermost web of material so that the cutting machine may penetrate into all of the curved outline portions defined by the pattern which is being duplicated or traced.

In accordance with the present invention there is provided a machine which includes tracer elements for actuating a series of punches which are operated to punch away portions of the piles, or single pile, of fabric along the outline of the pattern. In accordance with the invention these punches are arranged in a manner to effect an overlapping of the punched out portions of material as the fabric is being advanced through the machine. The punches operate in response to control by a pattern which is also advanced through a scanning portion of the machine at the same time. The machine operates by cutting a number of mutually overlapping perforations or punches into the web of material. Such an arrangement has the advantage that the patterns which are to be cut from the web may be closely spaced so that only a minimum distance between successive patterns is left. This, of course, means better utilization of the fabric material.

A feature of the present invention is the use of a scanning mechanism, through which mechanism a pattern templet is fed in controlled advancing movement. The mechanism includes electrical sensing means for actuating a plurality of punches on another portion of the machine which are reciprocated to effect perforating of the fabric in accordance with the outline of the pattern on the pattern templet. The pattern on the templet may be nothing more than a pencilled (graphite) outline and the sensing means includes means to electrically follow the outline of the conductive graphite particles of the pattern.

A further feature of the invention is that the device includes means for punching rows of overlapping perforations which in their entirety give an outline of a pattern of material which is loosened from the fabric. Adjacent punches located in a direction extending across the width of the web are arranged in overlapping fashion in order to insure that the perforations which are made effect actual cutting of the material by overlapped perforations which are cut by the punches into the fabric in accordance with the pattern outlined.

Accordingly, it is an object of this invention to provide

an improved machine for cutting patterns of textile materials.

A further object of the invention is to provide a machine for cutting patterns of textile material which includes machine portions for indexing a single or a plurality of piled webs of material and for simultaneously indexing a pattern templet and including sensing associated with the pattern templet indexing means for actuating punch members to effect a multiplicity of overlapping punches in the fabric material in accordance with the outline of the pattern templet as sensed by the sensing mechanism.

A further object of the invention is to provide a textile material pattern cutting machine in which the material is cut by making a series of overlapping punches into the material to form the pattern outline and in which the punching members for effecting the punching are arranged so that they overlap in a direction across the width of the material and are staggered in the direction of the advance of the material through the machine.

A further object of the invention is to provide a machine for cutting textile material which is simple in design, rugged in construction, and economical to manufacture.

In the drawings:

FIG. 1 is a front elevation partly broken away of a textile fabric pattern cutting machine constructed in accordance with the invention;

FIG. 2 is a longitudinal section on somewhat larger scale of the punching portion of the machine taken along the line 2—2 of FIG. 3;

FIG. 3 is a transverse section of the punching portion of the machine taken along the line 3—3 of FIG. 2;

FIG. 4 is a horizontal transverse section taken along the line 4—4 of FIG. 3;

FIG. 5 is a longitudinal section through the scanning portion of the machine taken along the line 5—5 of FIG. 6;

FIG. 6 is a transverse section through the scanning portion of the machine taken along the line 6—6 of FIG. 5;

FIG. 7 is a horizontal transverse section through a part of the scanning portion of the machine taken along the line 7—7 of FIG. 5;

FIG. 8 is an enlarged scale longitudinal section through a part of the scanning portion of the machine;

FIG. 9 is a top plan view of a textile fabric web indicating a pattern to be cut thereon and a portion thereof which has been cut by perforations made by the punching portion of the machine;

FIG. 10 is a somewhat schematic diagram showing the distribution of the keys and punches in the transverse rows of the scanning and punching portion of the machine; and

FIG. 11 is a diagrammatic showing of the distribution of the different working phases which occur during each revolution of the driving shaft of the machine.

Referring to the drawings in particular, the invention as embodied therein includes a textile pattern cutting machine which includes a punching portion generally designated A having means for indexing a web 69 of textile fabric into association with a plurality of reciprocating punch members which are individually actuated under the control of sensing devices located in a scanning portion of the machine generally designated B. The scanning portion B includes means for indexing a templet bearing a pattern past sensing apparatus so that the outline of the pattern may be detected and reproduced by the punching members in the punching portion A as both the templet and the fabric web are indexed through the machine together.

As indicated in FIG. 9 the web 69 is to be cut along a

circumferential line 20 which line is a duplicate on a greater or lesser scale of a similar outline on a pattern which is fed through the scanning portion B. The cut is made by a series of overlapping punching holes or perforations 21 which are made by reciprocating punching members which are actuated as a web of fabric 69 is advanced stepwise below a plurality of vertically reciprocable punches or punching rod members 87 (FIG. 3).

In accordance with the invention, the punching rod members 87 are distributed over an area which would encompass the maximum outline of the pattern to be traced and are located so that the punching members will make overlapping perforations in the fabric both in a direction across the web and in a direction of advance of the web through the machine.

The scanning mechanism B includes electrically controlled means for actuating the reciprocation of the punches 87 in accordance with a pattern outlined on a templet 34 which is fed through the machine in a stepwise or indexing movement. The scanning mechanism B includes vertically reciprocable cooperating contact members or keys 57 and 61 (FIGS. 5 to 8) corresponding in number and proportionate spacing to the punches 87 of the punching portion A. The scanning device B is traversed by a templet in the shape of a strip 34 (FIG. 5) which is indexed, or moved stepwise, through the scanning mechanism B in accordance with the movement of the web 69 through the punching mechanism A. The keys 57 and 61 are actuated in accordance with the outline of the pattern traced on the templet 34 and the web is simultaneously punched while it is traversing the punching portion B of the machine in accordance with the keys which are actuated. Since the punches are made to form overlapping holes 21 (FIG. 9) the material within the pattern outline is loosened from the web of fabric material. While the arrangement and pattern of the keys in the scanning portion B and of the punches in the punching portion A of the device are congruent, they need not necessarily be on the same scale. A transferring mechanism such as will be described hereinafter has to be provided in any case and the proportions may be increased or reduced from sensing by the scanning mechanism to actuation of the punching device.

In FIG. 10 there is indicated diagrammatically the general arrangement of both the punches 87 and the keys 57 and 61 of the scanning mechanism B. The punches 87 (or the corresponding keys 57 and 61) are staggered in four rows A, B, C and D and are designated by small letters *a*, *b*, *c* and *d*. Punch *b* overlaps the previous punch *a* in a line proceeding in a transverse direction as indicated by Q and the arrow in FIG. 10. The overlapping is by an amount *m*. Punch *a* lies in the first row A whereas punch *b* lies in the second row B. Correspondingly, the next punches *c* and *d* lie in overlapping relationship by an amount *m* with the preceding punches in the second and third rows B and C, respectively. The fifth punch *e* lies in the first row A and overlaps by an amount *m* the punch *b* in the fourth row D. The overlapping distance *m* is measured in a direction across the web as indicated by the arrow Q in each instance. The overlapping distance *m* in the present embodiment is of the order of one millimeter when the punch diameter is in the order of three millimeters. The lateral distance between the centers of two punches in each row is approximately two millimeters.

Referring to FIG. 1, a front casing 22 is shown partly broken away and behind it is mounted a drive motor 23 which is connected through a magnetic coupling 24 to a shaft including a sprocket wheel 26. The sprocket wheel 26 actuates a chain 25 to continuously and synchronously drive sprocket wheels 27 and 28 located on shafts 99 and 29, respectively. Shaft 29 is a main drive shaft which extends over the whole width of the machine. The end of the shaft crosses bearing walls 30, 30 located in the scanning portion B and the opposite end crosses bearing walls 31, 31 located in the punch portion A.

The scanning portion B of the machine is shown in further detail in FIGS. 5 to 8, and includes a bed plate 33 carried by the bearing walls 30, 30 which walls are spaced by a cross beam 32. A templet sheet or strip 34 is directed over the bed plate 33 and it carries a pattern outline which is to be traced on the web 69. The templet 34 need not be of the same size as the outline which is reproduced on the web 69 since the transferring electrical mechanism can be used to amplify or reduce the pattern outlined by controlling the actuation of punches 87 to produce a magnified or reduced outline. The templet 34 may be repeatedly used or replaced by another templet after each passing. If desired, the templet can be made endless so that it can be repeatedly directed through the scanning portion B of the machine.

The templet 34 is guided through the machine by a curved guide plate 35 at the inlet (FIG. 6) and by two cooperating endless belt conveyors 36 and 37, and directed through guiding channels 38 and 39 into association with the sensing or scanning key portion of the scanning mechanism B and thereafter directed outwardly between belts 40 and 41 and downwardly over a guide plate 42 (see FIG. 6). The scanning portion B includes sensing mechanism arranged above the bed plate 33 which is used as a scanning table. The sensing or scanning mechanism includes members which are movable up and down on vertical guide poles 43 against the action of compression spring 44, including three plates 45, 46 and 47 with spacers 48 and 49 arranged therebetween. All of these parts are held together by screws 50 and 51. A dowel pin 52 is provided to align the parts.

Mounted on the main shaft 29 is an eccentric or cam 53 which effects up and down movement of the scanning unit. The eccentric cooperates with a headpiece 54 which is slidable on the scanning unit. A spring 44 serves for the return movement of the scanning unit and the cam 53 effects the downward movement thereof against the force of the spring 44.

The headpiece 54 is connected to the spacer 48 by screws 55. Plates 46 and 47 are provided with registering bores in which sleeves 57 are received (FIG. 8). The sleeves 57 are guided for up and down movement and are urged into their bottom end position by compression springs 58 which are fitted over strap rings 59 and abut against the bottom of the plate 45. A scanning pin 61 is guided for up and down movement within the sleeves 57 (see FIG. 8). The pin is tightly wrapped with insulating material 60. The compression spring 62 bears on the plate 45 and a washer or ring 63 on the sleeves 57 and urges the sleeves 57 into a lowermost position in the scanning unit B.

The sleeves 57 and the pins 61 are made of electrically conductive material and are connected to an amplifier 65 by means of conduits or cables 64 (FIG. 6). Each pair of pins and sleeves are connected to a separate amplifier 65. Lines 79 extend from the amplifier 65 to a magnet 66 in the punching portion A of the machine (FIG. 3).

When the templet 34 is fed through the scanning portion of the machine B the circular bottom face of the cylindrical pin 61 and the annular bottom face of the sleeves 57 are urged by springs 58 and 62 onto the surface of the moving templet. The templet 34 advantageously carries a pencil line which is traced on the templet and contains graphite or other conductive material in the locations of the pattern outline. The graphite contacts the bottom faces of the sleeves 57 and the pin 61 and a conductive connection is made between these parts. The annular and circular cross sections of the sleeves and pin, respectively, provides an advantageous contacting surface which will insure that contact will be made by at least one point of these faces when a graphite outline is passed therebeneath.

The punching portion A of the machine as shown in particular in FIGS. 2 to 4 is similarly constructed to the scanning portion B. Cross pieces (FIG. 1) are arranged

to span bearing walls 31, 31 and a bottom plate 68 is supported between the bearing walls 31, 31 and serve as a matrix or lower guide for the punching procedure.

The web 69 is conveyed through the punching portion A of the machine by means which are similar to the means provided for the templet 34. Best seen in FIG. 3, they include a guide plate 70, an inlet conveyor belt 71 and 72, guide channels 73 and 74, and an exit conveyor comprising inlet belts 75 and 76 and finally an outlet guide plate 77.

Above the bottom plate or matrix 68 spaced vertical guide bolts 78 are positioned for guiding a vertically reciprocable cross piece 81 which bears on compression springs 83, the other end of which is inserted into guide sleeves 82 of a bridge member designated 80. The bridge member in turn is screwed to and bolted in walls 31, 31. A hold down plate 85 is mounted on a central bolt 84 (FIG. 2). The plate 85 is urged downwardly by compression spring 86 to a position at which the head of bolt 84 will lie against the bottom of a recess cut out for that purpose in cross piece 81. When the cross piece 81 is moved upwardly by the action of the springs 83, bolt 84 is lifted along with the hold down plate 85 and the web of material 69 is released. A multiplicity of punch members or punch rods 87 are arranged in a pattern corresponding to the scanning pin 61 for reciprocating up and down movement. The pins 87 are urged into their upper end position (FIGS. 1 and 3) by compression springs 88 which bear at one end on the hold down plate 85 and on the opposite end on snap ring 89 of the punches 87.

Holes 90 are cut into the base plate 68 in positions underlying each of the punch pins 87. A bolt 91 is screwed into the bridge 80 adjacent each of the punches 87 and it holds a rotatable bridge piece 92 which is urged against an upper stop portion 94 of the bolt 91 by a spring 93. The piece 92 can be moved between two end positions, one end position in which it overlies an associated punch 87 at a location beneath a portion of the cross piece 81 and another end position at which it is out of vertical alignment with the associated punch 87 (FIG. 3) and overlying cross piece.

The cross piece 81 is provided with downwardly extending projections or portions 95 and 96 arranged in vertical alignment with a respective punch 87 and each has a length such that the piece 92 when it is in the inturned or operative position, is capable of pressing down on the associated punch 87 when the cross piece is reciprocated downwardly to its lowest position. The length of the projections 95 and 96 is also such that there will be no contact between the piece 92 and the punch 87 when it is in its turned outwardly inoperative position.

In accordance with the invention, the turning out or in of the piece 92 is done by the previously mentioned electromagnets 66 which are connected by rods or bars 97 to the piece 92 (see in particular FIG. 4).

The cross piece 81 is reciprocated under the control of a cam or eccentric 98 which is keyed to the main shaft 29. This results in the constant reciprocating movement of the cross piece 81.

The shaft 99 drives the conveyor mechanism by means of an indexing mechanism, such as a Geneva wheel for example, to transmit intermittent indexing movement to the endless conveyor belts 36, 37, 40, 41, 71, 72 and 76 in order to provide completely synchronous intermittent drive of the templet 34 on the one hand and the web 69 on the other hand. The indexing mechanism may, of course, be interposed between sprocket 27 and shaft 99 so that the latter is intermittently driven. The rate of advancement of the templet 34 and the web 39 corresponds in the longitudinal direction to the distance of the axis of pin 61 and sleeves 57 and the punches 87, respectively, as measured in the direction of the width of the web or the templet as indicated in FIG. 10.

The operation of the machine is as follows: After the motor 23 has been switched on, the main shaft 29 rotates continuously, and the shaft 99 rotates intermittently, or it drives the conveyor mechanism intermittently. Eccentrics 53 and 98 move the keys 57, 61 and the punches 87 upwardly and downwardly at the same speed. In order to avoid closing of the current when the keys 57 and 61 contact the bottom plate 33 at the time when the templet 34 has not been moved therebeneath, the upper face of the plate is covered or made of an insulating material. At the time when the templet 34 (for instance a templet made of paper) and the web of material 69 are inserted at the inlet 35, they are intercepted by the stepwise operating conveyor belts 36, 37, 71 and 72, respectively, and are moved below the respective punching and scanning units A and B to further conveyor belts 40 and 41 at 75 and 76, respectively.

Each time the shaft 29 is rotated completely, a cycle or phase is accomplished as indicated in FIG. 11. As soon as the templet and the web are arrested after an advancement, as indicated by phase I in FIG. 1, the scanning unit descends on the templet 34 to begin phase II. The contact members 57 and 61 touch the templet while there is no current flowing through these devices. Means are provided to then initiate current flow through the control mechanism which occurs at the beginning of phase III. The magnet 66 will then become actuated when a first face of the sleeve key 57 and the pin key 61 contacts a pencil or other conductive material on the templet 34. This will effect electrical connection between the keys 61 and 57 as stated above. While the contacting member is still contacting the scanned position those punches which correspond to the current closing members will be actuated. The punches 87 are reciprocated by the descending cross member 81, after the corresponding magnet 66 moves piece 92 to an inward position over the associated punch 87. The descending piece 81 will move with one of its projections 95 and 96 and cause the punches 87 with the operative members 92 to pierce the fabric. Those punches which have not been actuated, that is those in which the pieces 92 have not been turned to an operative position, will not be moved at all when the cross piece 81 descends. By the punch pressing down, a hole will be formed in the web or the multiple piled web as the case may be and this will initiate phase IV. As soon as the punch has reached its bottom position during phase V, current will be switched off as long as the contacts 57, 61 are in the scanning position. Only afterwards, that is during phase VI, are the keys 57, 61 and the punches 87 lifted upwardly to the starting position.

From FIG. 1 it will be seen that forward and backward movement of a pair of the keys 57, 61 extends over phases II to VI but the forward and backward movement of the punch only extends over phases IV to VI. All six phases correspond to one revolution of the driving shaft 29. By accurate timing of the movement of the keys or contacts 57, 61 and the punches 87 as the templet advances and is scanned, rows of perforations will be punched on the web 69 in such a manner that the tangents laid to the perforations will define sometimes on an enlarged or sometimes on a smaller scale, the contour of the pattern to be cut corresponding to the pencil tracing of the pattern on the templet 34. Thus, the web 39 has a cutting line 20 designed thereon which corresponds to the contour of the pattern on the templet 34.

The device described can be modified without departing from the spirit of the invention. For instance, the current conducting marking can be printed. Closing of the current may be done other than by the contact members or keys 57 and 61 and the marked pencil strokes, such as by photocells which scan the templet, or by means of an electromagnetic key which is actuated by magnetic markings on the templet. Finally, the operation may be accomplished by keys which penetrate through holes of perforated templets.

While a specific embodiment of the invention has been

shown and described in detail to illustrate the application of the invention principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A machine for cutting patterns from webs of textile material and the like comprising means for indexing a web of fabric material through a prescribed path, a plurality of punching members located above said path and being vertically reciprocable down into said path, said punching members being arranged in rows to effect overlapping of punched holes in the fabric material as it is advanced and complete severance of the fabric along the lines of the punches, means for indexing a templet through a templet indexing path adjacent said web indexing path, and scanning means in said templet indexing path connected to said punch members and effective to initiate reciprocation thereof and punching of said material in accordance with the outline of said templet as each of said templet and said web are indexed through said paths.

2. A machine according to claim 1, wherein said scanning means includes a set of spaced contact members corresponding in arrangement and number to each of said punch members, said contact members being spaced apart and being arranged to contact portions of said templet whereby to form electrical contact together upon contact of a conductive material pattern outline on said templet.

3. A machine according to claim 1, including means for depressing said punch members, and control members interposed between said depressing means and said punch members and being connected to said scanning means, said control means being displaceable whereby to control actuation of said punch members by said depressing means.

4. A machine according to claim 1, including means for controlling the rate of advancement of said web and said templet, said rate of advancement corresponding to the distance of the axis of two adjacent punches when measured in a direction along the width of the web.

5. A machine for cutting patterns from webs of textile material and the like comprising means for indexing said textile material web through a first prescribed path, means for indexing a pattern through a second prescribed path, vertically reciprocable punch means located over said first path, said punch members being reciprocable downwardly to pierce said fabric and being arranged in rows to effect overlapping of punched holes in the fabric material as it is advanced and complete severance of the fabric along the lines of the punches, scanning means including vertically reciprocable first and second contact members arranged to reciprocate downwardly into contact with said pattern being advanced through said second path, drive means for said web indexing, pattern indexing, punch reciprocating, and scanning contact member reciprocating means, and control means connecting said first and second contact members and each of said punch means and being effective upon contact of said first and second contact members with a pattern outline on said templet to actuate said punch means.

6. A machine according to claim 5, wherein said punch means includes vertically reciprocable punch members arranged so that adjacent punches in the direction of the width of the web will overlap each other, said punch members being located in a similarly staggered arrangement in the direction of advancement of the web, a vertically reciprocable cross piece above said punch members for depressing said punch members, and control members being movable into the path of movement of said cross member for transmitting motion of said cross member to said punch members and being movable out of said path to permit said punch members to remain stationary when said cross member is reciprocated.

7. A machine according to claim 6, including electric circuit means connected to said first and second contact members including means effective when said contact members are electrically connected to move said control members to an operative position.

8. A machine according to claim 7, wherein said electric circuit means includes an electromagnet, a linkage connected to said control members, said control members being rotatable, whereby actuation of said first and second contact by contact of the faces thereof with conductive material on said pattern will cause rotation of said control members to effect reciprocation of said punch and perforations of said fabric.

9. A machine according to claim 5, wherein said first contact member comprises a sleeve, and said second contact member comprises an electrically insulated pin within said sleeve, said sleeve and said pin being arranged to reciprocate downwardly onto said pattern whereby electrically conductive material outlined thereon is effective to close the circuit between them.

10. A machine according to claim 5, wherein said scanning means includes a photoelectric cell means arranged to actuate said punch members in accordance with the changes of light intensity on said pattern.

11. A machine for cutting a pattern into a web of material such as textile fabric comprising a plurality of reciprocable punch members arranged in a plurality of rows at least equal in width to the width of said pattern, adjacent punch members in a direction across the width of said web being arranged with portions thereof overlapping and being offset from row to row, means to advance a web of material lengthwise into operative association with said punch members, and means to selectively reciprocate said punch members through said web of material in accordance with the pattern to be cut thereon whereby said punch members loosen the pattern from said web by a series of overlapping punches made along the said pattern outline.

12. A machine for cutting patterns from webs of material comprising means for indexing a web of material through a prescribed path, a plurality of punching members located adjacent said path, being reciprocable into said path and arranged in rows so that punch holes made by adjacent punching members in the direction of the width of the web will overlap each other and punch holes made of adjacent punching members in the direction of the advancement of the web will overlap, means for indexing a templet through a templet indexing path adjacent said web indexing path, and scanning means in said templet indexing path connected to said punching members and effective to initiate reciprocation thereof and punching of said material in accordance with the outline of said templet as each of said templet and said web are indexed through said path.

References Cited in the file of this patent

UNITED STATES PATENTS

1,001,514	Derbyshire	Aug. 22, 1911
2,376,724	Rice	May 22, 1945
2,690,222	Wilson et al.	Sept. 28, 1954
2,699,210	Ferrin	Jan. 11, 1955
2,911,045	Wright	Nov. 3, 1959