To all whom it may concern:

Be it known that I, CHARLES P. STANBON, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Channeling-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to boot and shoe machinery, and more particularly to certain improvements in channeling and other machines for operating upon the soles of boots and shoes preparatory to the incorporation of such soles in boots or shoes.

The present invention is illustrated as applied to that type of channeling-machine disclosed in Letters Patent of the United States No. 607,140, issued to me on the 12th day of July, 1898.

One object of the present invention is to provide a channeling or other machine which operates upon a shoe-sole prior to the incorporation of said sole in a boot or shoe, with an improved feeding-mechanism constructed and organized to cause the shoe-sole to maintain a proper relation to the instrumentality of the machine, such as channeling or other knives, and to greatly assist and facilitate the turning of the shoe-sole as the work progresses along the irregular contour thereof and proceeds around the toe.

A further object of the invention is to improve the holder of the grooving-knife and its support, whereby to greatly facilitate the removal and introduction thereto of the knife and also its ready adjustment in said holder, and, further, to insure the maintenance of the correct vertical adjustment of the grooving-knife support or carrier.

To the above end the present invention consists of the devices and combinations of devices which will be hereinafter described and claimed.

The present invention is illustrated in the accompanying drawings, in which—

Figure 1 shows a right-hand side elevation of a channeling-machine embodying the same.

Figure 2 shows a plan view of the channeling head. Figure 3 shows in vertical section the forward portion of the channeling head and a portion of the feed-roll and edge-guide. Figure 4 is a front elevation of the mechanism shown in Fig. 3. Figure 5 is a front view of the swing head with a portion of the frame broken out to show underlying construction. Figures 6 and 7 show, respectively, a section and elevation of the lower end of the support and knife-holder for the grooving-knife. Figure 8 is a perspective view of the grooving-cutter. Similar letters of reference will be used throughout the drawings and specification to designate corresponding parts.

The present invention is claimed in the patent hereinbefore referred to, and substantially as the details of arrangement are fully known by those persons skilled in this art I will not herein enter into a detailed description thereof, but will simply state that the swinging head A carries the upper feed-roll and the channeling and grooving knives and that it has a swinging movement about its fulcrum c, so that the said upper feed-roll and channeling-knives have a movement toward and away from the lower feed-roll to enable the work to be placed in and removed from the machine, the said swinging frame A being normally held down by spring mechanism in position to cause the upper feed-roll to engage the upper surface of the work.

In suitable bearings a in the frame A is mounted to rotate the main shaft B, which at one end is provided with fast and loose pulleys b b' or other form of start and stop mechanism, or the same may be provided with a crank b for rotating the shaft B by hand, or, as shown in the drawings, the adjacent faces of the fast and loose pulleys may be provided with friction or clutch faces which are controlled by the crank b, which crank also may be used to turn the shaft B, all as in Letters Patent of the United States No. 500,438, issued to me the 27th day of June, 1898.

In the present invention the lower feed-roll is formed in two parts, one of which is arranged to engage the marginal edge of the
sole and the other to engage the sole within the marginal edge, and the part which engages the marginal edge is rotated at a greater speed than the other part, and its surface is so formed that when the sole is pressed by the upper presser and feed roll against the other part of the lower feed-roll, which is rotated at a relatively slower speed, the action of the feeding-rolls will cause the sole edge to beswing against the edge guide or gage. The outer member of the lower feed-roll is shown at C, and it consists of a disk or wheel having preferably a notched or toothed periphery C, and is fixedly secured to the forward end of a shaft B', mounted to rotate in bearings a in the frame A, and said shaft is rotated from the main shaft B by means of a pinion b', carried by shaft B, which meshes with a gear b', carried by shaft B'.

The above arrangement is such that a rotation of the shaft B will by means of the pinion b' and gear b' impart a rotation to the shaft B' and the member C of the lower feed-roll carried thereby.

The inner member of the lower feed-roll is shown at C, and in the machine of the drawings comprises a disk having a grooved periphery c and a sleeve c', by means of which it is mounted to turn freely on the outer end of the shaft B'. A gear c' is provided upon one side with a sleeve which is received upon the sleeve c' of the inner member C of the lower feed-wheel, and the member C' and the gear c' are secured together by means of screws c', whereby a rotation of the gear c' will impart a rotary motion to the member C' of the lower feed-wheel.

In order to impart a rotary motion to the member C', the gear c' meshes with a gear c, fixedly secured to the outer end of the shaft B. It will thus be seen that a rotation of the shaft B will cause a simultaneous rotation of the members C and C' of the lower feed-wheel, and the relative sizes of the gears by means of which the rotary motion is imparted to the member C' is such that the speed of the member C' will be approximately twice that of the member C.

D represents a gage to bear upon the periphery or edge of the shoe-sole and position the same relatively to the channeling-knives or other instrumentalities of the machine. In the machine of the drawings the gage D is preferably arranged to rotate at the same speed of rotation as the inner member C' of the feed-wheel, and to secure this result the said gage is revoluently mounted on the stud d, mounted in a vertical position upon the outer end of a slide d', which slide is arranged to reciprocate in a suitable bearing d' and at its rear end is formed in cylindrical shape surrounded by a coiled spring d, which at one end bears against the slide d' and at its outer end against a fixed part of the frame d', whereby the slide d' is normally maintained in a forward position with the gage D in position to engage the edge of the shoe-sole. The slide d' is provided with a stud d'', which projects through a slot d', formed in a plate covering the guide-way d', and the stud d'' is engaged by one end of a bell-crank lever d', fulcrumed at d' to a fixed part of the frame, which lever is connected at one end to a rod d', which at its lower end is connected to a treadle, (not shown,) whereby the slide d' may be moved back against the tension of the spring d'' to retract the gage D. The gage D is revolved by the gear c' by means of a pin-gear d, forming on the under surface of the gage D, which when the slide d' is in its forward position is arranged to engage the gear c', the result being that as the gear d' revolves it will impart a rotary motion in the same direction to the gage D.

It will be noted that the periphery of the outer member C of the lower feed-roll is notched or serrated, as shown at c, and that the periphery of the inner member is provided with diagonal grooves c, the grooves being so disposed that when the member C' is revolved the said grooves will act to draw the shoe-sole in toward the periphery of the gage D, and as hereinbefore stated, inasmuch as the member C' is moving at approximately twice the speed of the member C the tendency of the member C' is to impart a relatively faster movement to that portion of the shoe-sole acted on by it than that portion of the shoe-sole which is acted on by the member C, and this action of the feed-rolls is such that the sole will be caused to swing in a horizontal plane from a point on the periphery of the outer member C, which to a certain extent is a fulcrum about which the shoe-sole is turned, and thus the edge of the shoe-sole will be constantly caused to bear against the periphery of the gage D, whereby the turning of the shoe-sole to bring all parts of its irregular contour under the action of the channeling-knives will be greatly facilitated, and to a certain extent this turning action is automatically performed without any assistance from the hands of the operator.

As usual in these machines, the upper presser and feed roll E is arranged to rotate simultaneously with the lower feed-roll, and for this purpose it is mounted on a shaft B', which is arranged to rotate in bearings a in the swinging frame A' and is provided with a gear b', which meshes with the gear b' on the shaft B'.

In the machine of the drawings, F represents the grooving-cutter, such as shown in Letters Patent No. 607,140, hereinbefore referred to, and as in such patented machine the grooving-cutter is mounted in the lower end of a vertically-movable knife-support f, which is arranged to have reciprocations in a guide-way g', in its lower end on the swinging frame A', and projecting from the upper end of the knife-carrier f is a cylindrical stem or rod f' which is surrounded by a coiled spring f'', which spring bears at its lower end against the upper end of the carrier f and at its up-
per end against a bearing \( f^4 \), through which the cylindrical stem \( f^2 \) projects. Said cylindrical stem is provided with a collar \( f^5 \), which is received between the bearing \( f^4 \) and another similar bearing \( f^3 \), whereby the vertical movement of the carrier \( f \) is limited in both directions. The arrangement so far as described of the knife-carrier is substantially the same as in the patent referred to.

It has been discovered in practice that the constant moving of the knife-carrier \( f \) has a tendency to cause the cylindrical rod \( f^2 \) to turn in its threaded bearing in the carrier \( f \), and therefore cause a displacement of the vertical adjustment of the knife-carrier and the knife carried thereby.

In order to prevent the rod \( f^2 \) from turning in its bearing, I have provided a suitable friction or tension device engaging said rod arranged to prevent its accidental turning, but not to interfere with its vertical movements. This friction device, as shown in the drawings, comprises a spring-yoke \( f^7 \), which is formed of a piece of spring-wire secured by means of a screw \( f^8 \) to the top of the forward end of the swinging frame \( A \) and which at a point intermediate of its ends is suitably coiled. As shown at \( f^9 \) to form bearing for a screw \( f^{10} \), and beyond the coil of the bearing \( f^2 \) the spring is bent to form the yoke \( f^7 \), which is received within a groove \( f^{11} \), formed in the head of the cylindrical rod \( f^2 \), and its free end is provided with an eye \( f^{12} \), through which the screw \( f^{10} \) passes and by means of which the yoke may be caused to move or less frictionally engage the groove \( f^{11} \). The above arrangement is such that by tightening up the screw \( f^{10} \) the yoke is caused to bind in the groove \( f^{11} \) and prevent the accidental turning of the cylindrical rod \( f^2 \).

The lower end of the knife-carrier \( f \) is formed with a cylindrical bearing \( g \), which is arranged in the knife-carrier, as shown in the drawings.

The clamping-disk \( h^2 \) is provided with a cylindrical stem \( h^3 \), arranged to be received within the bore of the cylinder \( h \). The cylindrical stem \( h^3 \) is provided with a threaded bearing \( h^4 \), which receives a threaded bolt \( h^5 \), which at its outer end is provided with a collar \( h^6 \) and a polygonal head \( h^7 \), by means of which the screw \( h^8 \) may be turned to cause the clamping-disk \( h^2 \) to move toward and from the head \( h \) to clamp and release the grooving-knife.

The grooving-knife \( F \) is shown in Fig. 8 of the drawings and is preferably formed with a forked shank \( h^8 \), which is arranged to be received between the head \( h \) and the clamping-disk \( h^2 \), and by means of the threaded screw \( h^9 \) the said clamping-disk \( h^2 \) may be moved toward the head \( h \) between which the shank \( h^8 \) of the grooving-knife may be tightly clamped in the knife-holder \( H \).

The machine is provided with any usual form of channelling-knife \( g^1 \) and presser-foot \( g^2 \), which may be constructed and arranged in any manner usual in these machines.

In the operation of the present invention the shoe-sole to be channeled is placed in position with its edge between the upper presser and feed roll \( E \) and the lower feed-rolls \( C \) and \( C' \), with its edge bearing against the gage \( D \). Rotary motion is then imparted to the shaft \( B \) and causes the rolls \( E \) and \( C \) and \( C' \) and the gage \( D \) to rotate and move the shoe against the cutting edges of the channelling-knife \( g^1 \) and the grooving-knife \( F \), which will cut a grooved or plain channel in the surface of the shoe, according as the grooving-knife is lowered or raised, and as before stated, the action of the lower feed-rolls \( C \) and \( C' \) is such that the sole as it moves along will be caused to engage the surface of the gage \( D \) and be readily turned as the work progresses.

I would further state that I do not consider the present invention as limited to the details of construction herein shown and described; but,

Having described the construction and mode of operation of one embodiment of my invention, I claim as new and desire to protect by Letters Patent of the United States—

1. In a machine for operating on shoe-soles, the combination with a presser and a feed roll and mechanism to rotate said rolls, of a gage-roll mounted on a slide, means under control of the operator to advance and retract said slide toward and from the feed-roll, and a gear connection between the feed-roll and gage-roll whereby the gage-roll is driven by the feed-roll, substantially as described.

2. The combination with a knife-support and a threaded adjusting extension connected therewith, of means to raise and lower said support and extension, and a spring friction device engaging the extension to prevent its accidental turning, substantially as described.

3. The combination with a knife-support, provided with a clamp-bearing, of a knife-holder arranged in said bearing, said knife-holder comprising a headed cylinder, a disk provided with a shank or stem, said stem having an internal threaded bearing, and a threaded bolt engaging the threaded bearing of the shank or stem of the disk and arranged to move said disk toward and away from the head of the cylinder, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES P. STANBON.

Witnesses:
T. HART ANDERSON,
A. E. WHYTE.