

April 12, 1960

R. GEHRER ET AL
SKIVING MACHINES

2,932,372

Filed Sept. 18, 1956

3 Sheets-Sheet 1

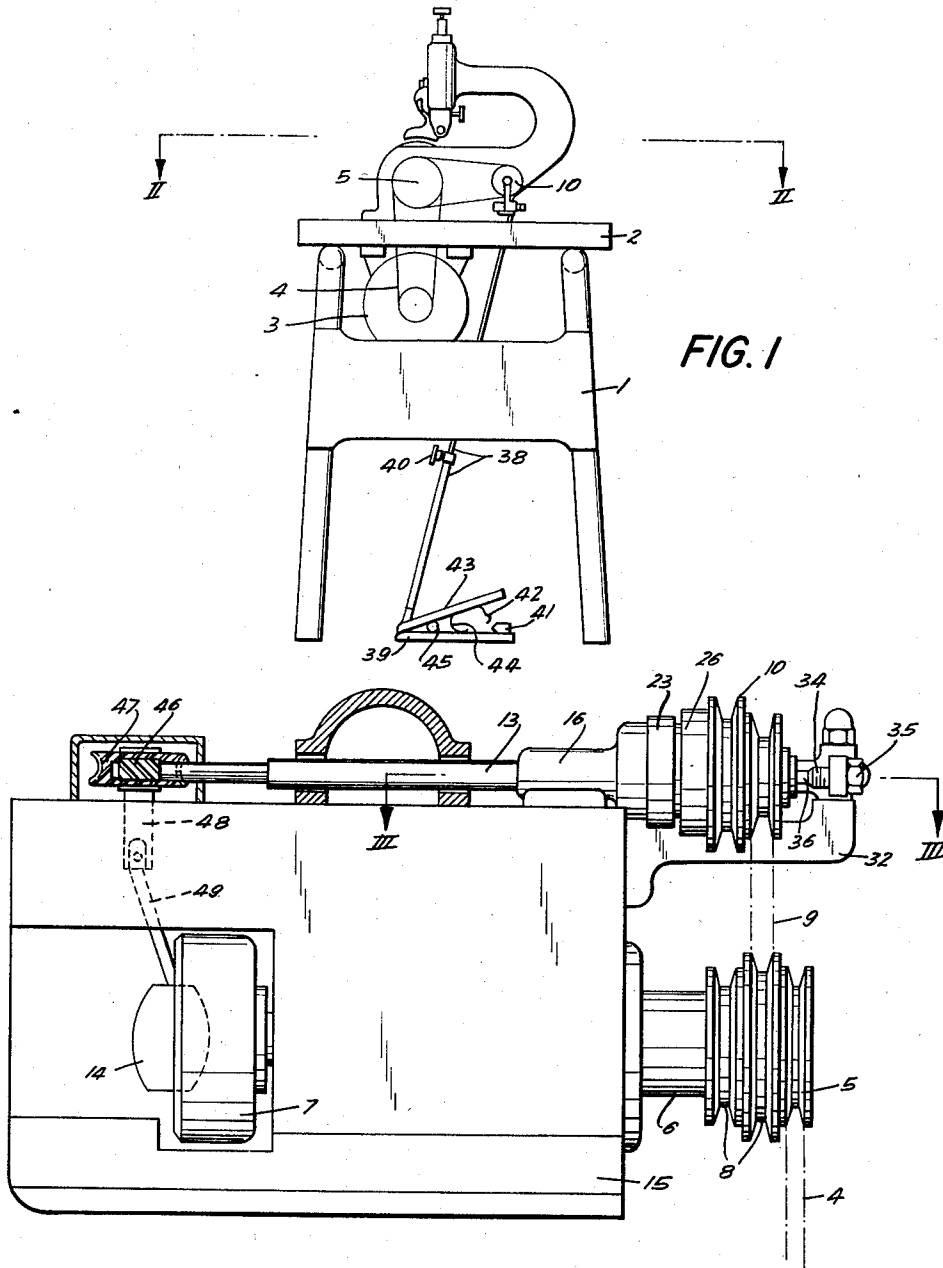


FIG. 2

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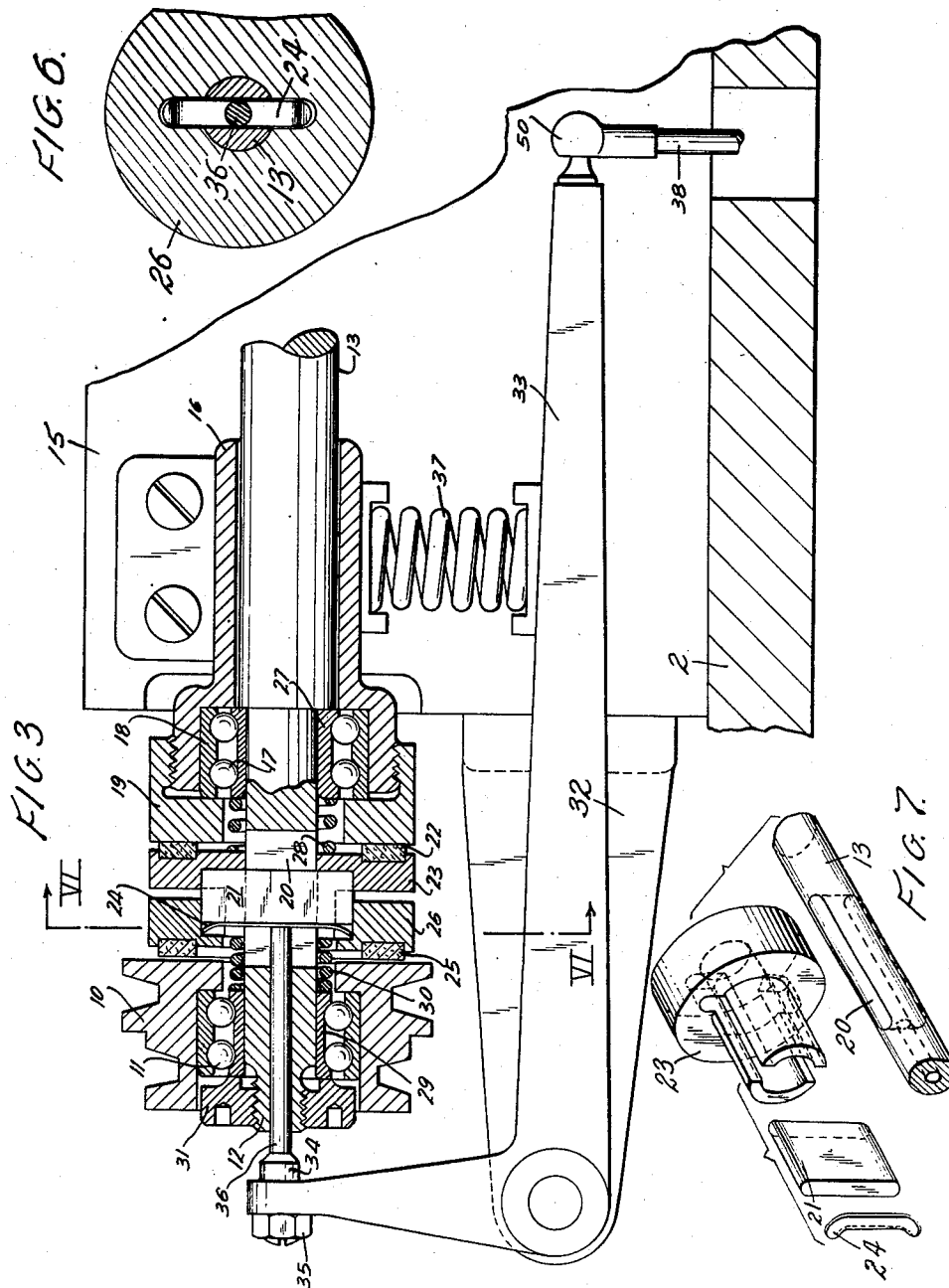
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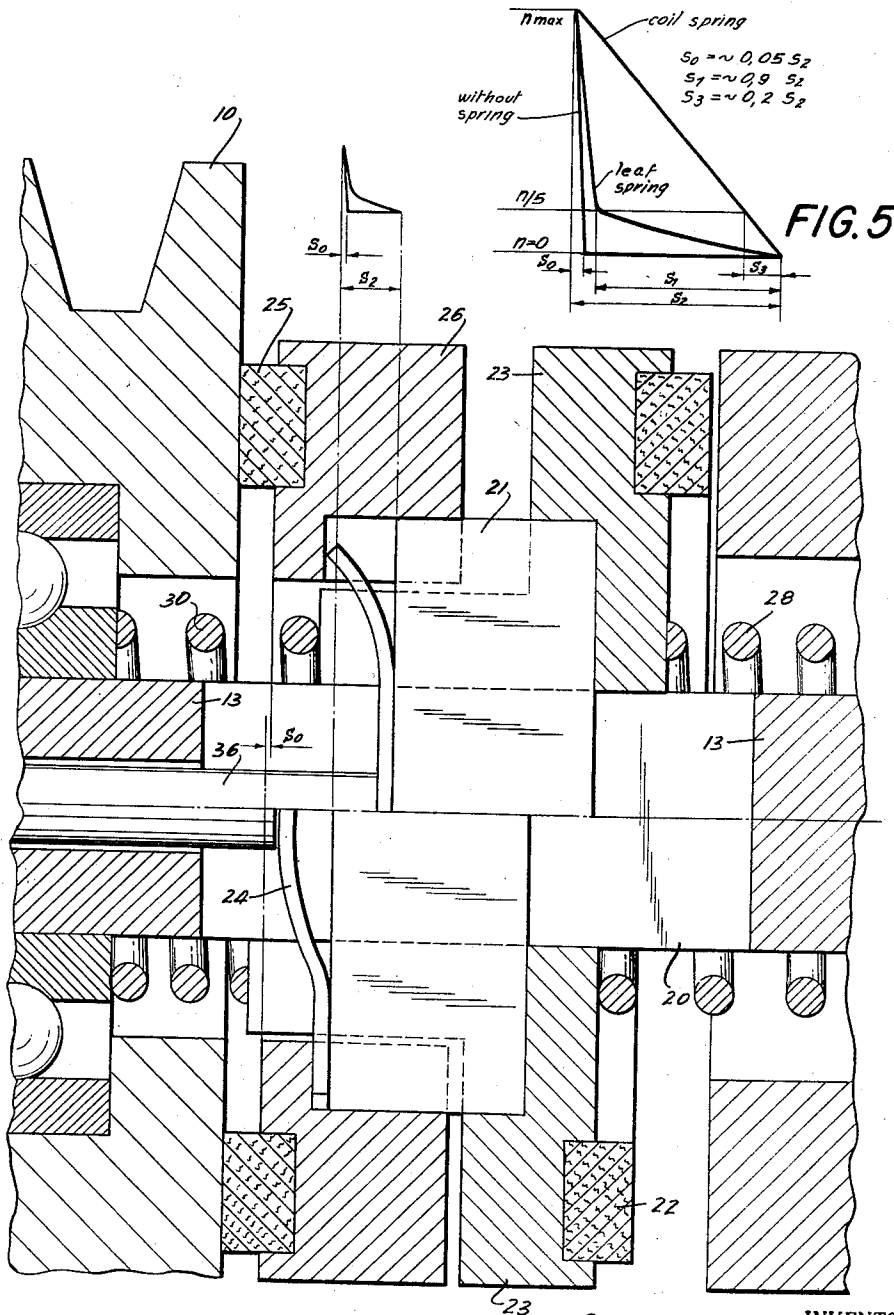


FIG. 4

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2,932,372

SKIVING MACHINES

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Application September 18, 1956, Serial No. 610,510

Claims priority, application Germany September 22, 1955

13 Claims. (Cl. 192—18)

The present invention relates to machines for cutting or trimming sheet material, such as skiving machines used in cutting the edges of pieces of leather.

In skiving machines it is customary for the operator to hold the sheet material on a feed roller while moving sheet material with respect to the annular cutting edge of a bell-shaped cutter. Certain workpieces have special curvatures which are particularly difficult to skive because the feed roller and skiver rotate at speeds which are maintained at a predetermined relationship with respect to each other. In conventional machines these speeds are constant or the speeds of the feed roller and skiver increase and decrease together while maintaining the same relationship. Thus, it becomes necessary when handling certain workpieces for the operator to hold the workpieces in such a manner that the feed roller slips with respect thereto, and only poor results can be obtained in this way. Moreover many pieces are spoiled and can be used only as waste as a result of this drawback.

One of the objects of the present invention is to provide a skiving machine in which the speed of rotation of the feed roller can be accurately and conveniently regulated by the operator without altering the speed of rotation of the skiver.

Another object of the present invention is to provide a skiving machine in which the speed of rotation of the feed roller can be independently regulated without the use of complex expensive installations such as gear reduction assemblies or the like.

An additional object of the present invention is to provide a structure capable of providing a convenient accurate regulation of the speed of rotation of the feed roller particularly at the lower speeds thereof.

A further object of the present invention is to provide a single compact simple assembly capable of being used on the one hand to regulate the speed of rotation of the feed roller and on the other hand to brake the rotation of the feed roller.

It is also an object of the present invention to provide an operating structure, capable of being actuated by the operator to regulate the speed of rotation of the feed roller, which can be adjusted conveniently to the needs of the particular operator so as to be accessible to a foot of the operator, for example, and which at the same time will reliably remain in its adjusted position.

With the above objects in view the present invention mainly consists of a skiving machine which includes a feed roller drive shaft for driving the feed roller so that the latter can move a workpiece with respect to a skiver. This drive shaft is supported for rotation about its axis by a suitable support means. A driving pulley is coaxial with and freely rotatable with respect to the drive shaft, and a stationary plate surrounds the drive shaft and is spaced axially from the pulley. A first disc freely surrounds the drive shaft, is located between the pulley and stationary plate, and has a side face directed toward and located adjacent a side face of the pulley. One of these side faces carries a layer of a material of a high coefficient of friction. A second disc is located between the

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first disc and the stationary plate and has a side face directed toward and located adjacent a side face of this plate, one of the latter side faces also carrying a layer of a material of a high coefficient of friction. A motion transmitting member is connected to the shaft for rotation therewith but is free to move axially with respect thereto, and this motion transmitting member is located between the first and second discs and is axially shiftable with respect to the latter while these discs are constrained to rotate with the motion transmitting member. This latter member is operatively connected to the discs in such a way that when the motion transmitting member is moved toward the pulley the first disc is moved by the motion transmitting member toward the pulley, and when the motion transmitting member is moved toward the stationary plate the second disc also moves toward the stationary plate. Thus, in one direction of movement the motion transmitting member provides driving engagement between the pulley and first disc so that the pulley rotates the shaft, and in the opposite direction of axial movement the motion transmitting member causes the second disc to cooperate with the stationary plate through the layer of high friction material therebetween to brake the rotation of the shaft. A special spring is located between the motion transmitting member and the first disc in order to enable the speed of rotation of the feed roller drive shaft to be very accurately regulated.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a side elevational view of a machine according to the present invention;

Fig. 2 is a partly sectional plan view of the machine taken along line II—II of Fig. 1 in the direction of the arrows;

Fig. 3 is a fragmentary, sectional view on an enlarged scale showing details of the structure of the invention, Fig. 3 being taken along line III—III of Fig. 2 in the direction of the arrows;

Fig. 4 is a fragmentary sectional view showing part of the structure which is also shown in Fig. 3 at a scale greater than that of Fig. 3, the structure of Fig. 4 being shown in one position above the horizontal center line of Fig. 4 and in another position below this center line;

Fig. 5 graphically illustrates the operation and characteristics of a spring which forms part of the present invention;

Fig. 6 is a fragmentary, sectional view taken along line VI—VI of Fig. 3 in the direction of the arrows; and

Fig. 7 is an exploded, perspective view showing some of the members illustrated in Fig. 3.

As may be seen from Fig. 1, the machine includes a suitable frame 1 which supports a work table 2. A motor 3 is carried by the table 2 at the underside thereof, and this motor drives a pulley belt 4 which in turn drives the pulley 5. The belt 4 is shown in dot-dash lines in Fig. 2 which also shows the shaft 6 which rotates together with the pulley 5. The shaft 6 is supported for rotation about its axis in suitable bearings, and at its left end, as viewed in Fig. 2, the shaft 6 carries the skiver 7 which rotates with the shaft 6, so that in this way the skiver is driven. The skiver is in the form of a bell or cup-shaped member having a left annular edge, as viewed in Fig. 2, which forms the cutting edge of the skiver.

As may be seen from Fig. 2, the pulley 5 is fixed coaxially to a stepped pulley 8 which rotates together

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with pulley 5 and the shaft 6, and a belt 9 transmits the rotation of the pulley 8 to the pulley 10. Referring now to Fig. 3, it will be seen that the pulley 10 is supported for free rotation about its axis by a ball bearing 11 which is mounted on the end portion 12 of an elongated feed roll drive shaft 13 which drives the feed roll 14 shown in Fig. 2. The feed roll 14 is supported for rotation about its axis by any suitable unillustrated structure, and the axis of the feed roll 14 is perpendicular to that of the shaft 6 and skiver 7. As is well known in the art, the sheet material such as leather is placed on the feed roll 14 which moves it with respect to the skiver 7 in such a way that the desired cutting of the sheet material at the edge thereof is obtained.

The housing 15 fixedly carries a tubular member 16 (Fig. 3) through which the shaft 13 freely passes, and the left end of the tubular member 16, as viewed in Fig. 3, is enlarged and receives a ball bearing 17 which supports the shaft 13 for rotation about its axis, so that parts 15-17 form a support means which supports shaft 13 for rotation. The outer race 18 of the bearing 17 is pressed to the right, as viewed in Fig. 3, against a shoulder in the interior of the tubular bearing housing 16 by a cap nut 19 threaded onto the left end of housing 16, as viewed in Fig. 3, and having a left wall which bears against the left end face of the race 18, this left wall of the cap nut 19 being formed with an opening through which the shaft 13 freely passes.

The shaft 13 is formed adjacent its end portion 12 with an elongated, axially extending cutout 20 defined in part by a pair of opposed parallel planar surfaces which extend parallel to the axis of shaft 13. These surfaces are slidably engaged by a pair of outer parallel side faces of a rectangular block 21 which forms a motion transmitting member and which extends through and beyond the cutout 20 in a direction transverse to the axis of shaft 13. As is apparent from Fig. 3, the width of the motion transmitting member 21 is considerably less than the length of the cutout 20 so that the member 21 is free to shift axially with respect to shaft 13 while being constrained to rotate therewith.

An annular layer 22 of a material of a high coefficient of friction, such as the material used for brake shoes, is carried by a disc 23 at the right side face thereof as viewed in Figs. 3 and 4. The disc 23 is formed with an opening through which the shaft 13 freely passes so that were it not for member 21 the disc 23 would turn freely with respect to shaft 13. The disc 23 is coaxial with shaft 13 and has an elongated hub extending from the left side face of the disc 23, as viewed in Figs. 3 and 4. This elongated hub of disc 23 and a portion of the latter adjacent the hub thereof are formed with cutouts defined by surfaces which form continuations of the opposed parallel surfaces of cutout 20 which are slidably engaged by opposed side faces of member 21, respectively, so that these side faces of member 21 also slidably engage the opposed parallel surfaces of disc 23 which define the cutouts thereof shown in Figs. 3 and 4. Thus, the elongated tubular hub of disc 23 is formed with a pair of opposed parallel slots through and beyond which opposite end portions of member 21 freely pass, respectively, and the part of disc 23 adjacent its hub is formed with an elongated rectangular cutout forming a continuation of the hub slots and extending across the bore of disc 23 through which shaft 13 passes, the right edge portion of member 21, as viewed in Figs. 3 and 4, being located in this rectangular cutout as can be best visualized from Figs. 6 and 7. It is apparent that elements 21 and 23 are constrained to rotate with shaft 13 but are free to shift axially therealong. The left end wall of cap nut 19 forms a stationary plate whose outer left side face, as viewed in Figs. 3 and 4, cooperates with the layer 22 to act as a brake for braking the rotation of the shaft 13.

A leaf spring 24 having special spring characteristics

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described below also extends through and beyond the cutout 20 and has its right face in engagement with the left face of the motion transmitting member 21, as viewed in Figs. 3 and 4. The leaf spring 24 is of substantially rectangular configuration and has its free ends respectively located in a pair of elongated axial cutouts formed at the inner periphery of an annular disc 26 which carries at its left face, as viewed in Figs. 3 and 4, an annular layer 25 of a material of a high coefficient of friction which may be the same material as that used for the layer 22. The elongated opposed axial cutouts at the inner periphery of the disc 26 are rectangular in cross section and slidably receive the upper and lower left corner portions of the member 21, as viewed in Figs. 3 and 4, so that the disc 26 is constrained to rotate with the member 21 while being axially shiftable with respect to shaft 13, and members 21 and 26 are also axially shiftable with respect to each other.

The left end face of the inner race 27 of the bearing 17 serves as an abutment for the right end of a coil spring 28, as viewed in Figs. 3 and 4, this coil spring 28 being coiled about the shaft 13 and having its left end in engagement with the right side face of disc 23, so that the spring 28, which is under compression, urges the disc 23 together with motion transmitting member 21 to the left, as viewed in Figs. 3 and 4, away from cap nut 19.

The right end face of the inner race 29 of the bearing 11 serves as an abutment for the left end of a coil spring 30 which is coiled about the shaft 13 and which bears with its right end against the left end face of the hub of the disc 23, as viewed in Figs. 3 and 4, this spring 30 being weaker than the spring 28. This inner race 29 slidably engages the shaft 13 and is urged by the spring 30 against a nut 31 threadedly carried by the end portion 12 of shaft 13. Thus, when the shaft 13 is stationary the nut 31 may be turned to adjust the distance between pulley 10 and disc 26, and spring 30 reliably maintains the bearing 11 in its adjusted axial position where its inner race 29 abuts against the nut 31.

The housing 15 which is carried by the table 2, as indicated in Fig. 3, fixedly carries a bracket 32 which in turn carries a pivot pin on which a bell crank 33 is turnable. As is apparent from Fig. 3, the bell crank 33 has an upwardly extending arm and a substantially horizontally extending arm considerably longer than the upwardly extending arm. The latter arm is provided at its free end with a threaded bore which threadedly receives a threaded stud 34 which carries a lock nut 35. Thus, after the stud 34 is turned so that its right end, as viewed in Fig. 3, extends to a desired extent beyond the upper free end of the shorter arm of bell crank 33, the lock nut 35 is turned to fixedly maintain the stud 34 in its adjusted position. The right free end of the stud 34 engages the left end of an elongated push rod 36 which extends slidably through an axial bore formed in the end portion 12 of shaft 13 and communicating with the cutout 20 thereof. The right end of push rod 36, as viewed in Fig. 3, bears directly against the left face of the leaf spring 24, as viewed in Figs. 3 and 4. A coil spring 37 is compressed between a stationary member fixed to housing 15 and the longer arm of bell crank 33 so that this coil spring tends to turn the bell crank in a clockwise direction, as viewed in Fig. 3. Coil spring 37 is considerably stronger than the total of the forces of the springs 24 and 28 which oppose the spring 37.

The free end of the longer arm of the bell crank 33 fixedly carries the ball member of a ball and socket joint 50 whose socket member is fixed to an elongated rod 38 composed of tubular sections which are telescopically slidable with respect to each other so that the length of the rod 38 may be adjusted. The upper portion of the rod 38 extends freely through an opening of the table 2, as is apparent from Fig. 3, and a manually turnable screw member 40 may be loosened when it is desired to adjust the length of the rod 38 and may then be tightened to

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maintain the rod 38 at its adjusted length, as is diagrammatically illustrated in Fig. 1. The bottom end of the rod 38 is pivotally connected to a pedal means which includes a base plate 39 resting directly on the floor. The base plate 39 carries at its top face a stationary catch member 41 which cooperates with a springy catch member 42 carried by the underside of the tiltable pedal 43 which is urged to turn in a counterclockwise direction, as viewed in Fig. 1, by a leaf spring 44 located between and bearing against pedal 43 and base plate 39. A hinge 45 is located between and connected to pedal 43 and base plate 39 to provide the turnable mounting of pedal 43 on base plate 39. When the operator has turned the pedal 43 in a clockwise direction, as viewed in Fig. 1 through an angle sufficient to cause the springy catch member 42 to latch with the stationary catch member 41, these catch members cooperate to maintain the pedal 43 in the position which it has been turned against the force of spring 44 and spring 37. It will be noted that the spring 37 urges the rod 38 downwardly at all times and that this rod 38 is always under compression. As a result the pedal means is continually pressed against the floor. With this arrangement the operator can adjust the length of rod 38 so as to locate the pedal means at the most comfortable position and the pedal means will not shift from this position because it is continually pressed against the floor.

As may be seen from Fig. 2, the feed roll drive shaft 13 fixedly carries a worm 46 which is coaxial with the feed roll drive shaft 13 and which rotates therewith, and the worm 46 turns a worm wheel 47 fixedly carried by a shaft 48 supported by any suitable bearing structure for rotation about its axis. The end of shaft 48 distant from worm wheel 47 is connected to a universal joint which is in turn connected to a rod 49 whose end distant from the shaft 48 is connected by another universal joint to an end of the feed roll 14, so that in this way the drive is transmitted from the shaft 13 to the feed roll 14.

The above described structure operates as follows:

The parts are shown in Figs. 1 and 3 in their rest position. In this position of the parts the layer 25 is spaced from the right face of the pulley 10, as viewed in Fig. 3, so that the latter does not transmit the drive to the shaft 13. Furthermore, the spring 37 causes the push rod 36 to press leaf spring 24 against motion transmitting member 21, and the force of spring 37 is thus transmitted to the disc 23 to press the layer 22 against the stationary cap nut 19 so that the shaft 13 is braked and stopped, spring 37 being stronger than the total forces of springs 24 and 28.

When the operator wishes to start the rotation of feed roll 14, skiver 7 and pulley 10 rotating continuously during operation of the machine, he turns the pedal 43 in a clockwise direction, as viewed in Fig. 1, so as to raise the rod 38 and turn the bell crank 33 in a counterclockwise direction, as viewed in Fig. 3, against the force of spring 37 to compress the latter further. This action frees the discs 23 and 26 to the influence of springs 28 and 24, respectively, the spring 28 being so much stronger than the spring 30 that the latter functions principally to maintain the race 29 against the nut 31. Thus, the disc 23 shifts to the left to move the layer 22 away from cap nut 19 and the disc 26 moves toward the pulley 10 so that the layer 25 engages the right side face of pulley 10, as viewed in Fig. 3, and in this way a drive is transmitted to the shaft 13 which rotates together with the pulley 10 when the pedal 43 is fully depressed and the spring 37 is compressed sufficiently to eliminate its influence on the discs 23 and 26. When the layer 25 first engages the pulley 10 there is a slippage between these elements so that the shaft 13 at first rotates at a speed less than the pulley 10. When the operator wishes to stop the rotation of the feed roll 14, he presses with his toe against the left end of pedal 43, as viewed in Fig. 1, so as to turn the pedal in a counterclockwise direction,

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and it is only necessary for the operator to apply sufficient force to release catch member 42 from catch member 41, and then the spring 37 expands and automatically returns the parts to the position where the rotation of shaft 13 is braked and stopped. It will be noted that with the structure of the invention the energy for maintaining the parts both in the position where the shaft 13 is driven and in the position where it is stopped is derived solely from the springs.

The distance through which the disc 26 shifts axially from the time when the layer 25 first engages the pulley 10 until the time when the layer 25 is pressed forcefully against the pulley 10 to transmit the drive without slip is quite small and is indicated in Fig. 4 at S_0 . If the spring 24 were omitted and the disc 26 shifted directly with member 21, it would be necessary for the operator to actuate the pedal in a very precise manner so as to maintain the layer 25 somewhere in the range S_0 to provide a desired speed of rotation of the feed roll less than its final operating speed. Moreover, with a skiving machine it is particularly desirable to maintain the feed roll 14 at speeds within the lower range of the speeds of rotation of the feed roll 14. It is apparent that without the spring 24 it would be extremely difficult to control the speed of the feed roll at all, and it would be impossible to precisely maintain the feed roll at a relatively low speed of rotation. The spring 24 is carefully chosen so as to eliminate these drawbacks.

As may be seen from Fig. 4, during the time that the disc 26 shifts axially through the distance S_0 , the motion transmitting member 21 acts on the spring 24 while moving through the distance S_2 which is many times greater than the distance S_0 . In actual practice this latter distance may be only a fraction of a millimeter, so that the spring 24 provides a means for accurately controlling the engagement between pulley 10 and layer 25.

The graph of Fig. 5 illustrates the operation of the spring 24 which may have a length of 30 millimeters and which may be cut from a strip of spring steel 4 mm. wide and 0.5 mm. thick. The characteristic of the leaf spring 24 is not a straight line. The distance S_2 indicates the movement of the spring from the position thereof at the upper part of Fig. 4 where the free ends of the spring curve to the left to the position thereof at the lower part of Fig. 4 where the ends of the spring are clamped between elements 21 and 26 and where the central portion of the spring bulges to the left. The characteristic of the spring 24 is such that during approximately $\frac{1}{10}$ of its movement, as represented by the distance S_1 , it causes the layer 25 to be pressed against the pulley 10 with only $\frac{1}{5}$ of the final pressure so that during this $\frac{1}{10}$ of the movement of the spring 24 the speed of rotation of the shaft 13 reaches only $\frac{1}{5}$ of its final speed of rotation shown at $n_{\max}$ in Fig. 5. It is during the last $\frac{1}{10}$ of the movement of the spring 24 that the speed of rotation of shaft 13 increases from $\frac{1}{5}$ of its final speed up to its final speed. As a result it is possible for the operator to very precisely control the speed of rotation of the shaft 13 in the lower fifth of its range of speeds, and this is particularly important for a skiving machine. This arrangement may be contrasted with an arrangement where a conventional coil spring having a straight line characteristic is substituted for the leaf spring. Such a straight line characteristic is shown in Fig. 5, and with such a spring it is apparent that $\frac{1}{5}$ of the final speed of rotation of the shaft 13 is obtained when the spring is compressed through only relatively short distance S_3 , so that very poor control in the lower range of speeds can be provided with a spring having a straight line characteristic. Thus, the use of a spring having the characteristic of the spring 24 as described above is of considerable importance. The distance S_3 is approximately $\frac{1}{5}$ of the total distance S_2 while the distance S_1 is approximately $\frac{1}{10}$ of this total distance.

As an example of the advantages derived from this

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structure, if it is assumed that the pedal 43 turns through a total angle of 20°, then with the above described leaf spring 24 the pedal can be turned through 18° to control the speed of rotation of the feed roll 14 anywhere within the lower fifth of its range of speeds, while the last two degrees of turning of the pedal increases the speed of the feed roll from 1/5 of its final speed to its final speed.

It will be noted that the structure described above is relatively simple and at the same time renders it possible to control the feed roll independently of the skiver. Furthermore, a glance at Fig. 3 will show that the structure for connecting the drive to the shaft 13 and for braking the shaft is in the form of a single unitary assembly which is extremely compact and which is carried by the shaft 13 itself.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of sheet material cutting machines differing from the types described above.

While the invention has been illustrated and described as embodied in skiving machines, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a skiving machine, in combination, a drive shaft adapted to drive a feed roll which feeds a workpiece with respect to a skiver; support means supporting said drive shaft for rotation about its axis; a pulley coaxial with and freely turnable with respect to said shaft; a disc member and a block member coaxial with said shaft and being axially shiftable with respect to each other while constrained to rotate together, one of said members being axially shiftable with respect to said shaft while being constrained to rotate therewith, said disc member having a side face directed toward and located adjacent a side face of said pulley; a layer of a material of a high coefficient of friction carried by one of said side faces so that when the other of said side faces presses against said layer the rotation of said pulley will be transmitted to said disc member so as to rotate said shaft; and spring means located between and freely abutting against said members and urging said block member with respect to said disc member in a direction directed away from said pulley, so that when said block member is moved toward said pulley the pressure of said other side face against said layer will be determined by the extent to which said spring means is compressed and independent of any movement of said disc member toward said side face of said pulley.

2. In a machine, in combination, a drive shaft; support means supporting said drive shaft for rotation about its axis; a pulley coaxial with and freely turnable with respect to said shaft; a disc member and a block member coaxial with said shaft and being axially shiftable with respect to each other while constrained to rotate together, one of said members being axially shiftable with respect to said shaft while being constrained to rotate therewith, said disc member having a side face directed toward and located adjacent a side face of said pulley; a layer of a material of a high coefficient of friction carried by one of said side faces so that when the other of said side faces presses against said layer the rotation of said pulley will be transmitted to said disc member so as to rotate said shaft; and spring means located between and freely

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abutting against said members and urging said block member with respect to said disc member in a direction directed away from said pulley, so that when said block member is moved toward said pulley the pressure of said other side face against said layer will be determined by the extent to which said spring means is compressed, said spring means having a characteristic which gradually increases the pressure of said other side face against said layer during the greatest part of the compression of said spring means and which suddenly increases said pressure to its final value during a final relatively small fraction of the compression of said spring means.

3. In a machine, in combination, a drive shaft; support means supporting said drive shaft for rotation about its axis; a pulley coaxial with and freely turnable with respect to said shaft; a disc member and a block member coaxial with said shaft and being axially shiftable with respect to each other while constrained to rotate together, one of said members being axially shiftable with respect to said shaft while being constrained to rotate therewith, said disc member having a side face directed toward and located adjacent a side face of said pulley; a layer of a material of a high coefficient of friction carried by one of said side faces so that when the other of said side faces presses against said layer the rotation of said pulley will be transmitted to said disc member so as to rotate said shaft; and spring means located between and freely abutting against said members and urging said block member with respect to said disc member in a direction directed away from said pulley, so that when said block member is moved toward said pulley the pressure of said other side face against said layer will be determined by the extent to which said spring means is compressed, said spring means being in the form of a leaf spring having a characteristic which gradually increases the pressure of said other side face against said layer during the greatest part of the compression of said spring means and which suddenly increases said pressure to its final value during a final relatively small fraction of the compression of said spring means.

4. In a machine, in combination, a drive shaft; support means supporting said drive shaft for rotation about its axis; a pulley coaxial with and freely turnable with respect to said shaft; a stationary plate spaced from said pulley and surrounding said shaft; a first disc surrounding said shaft and having a side face directed toward and located adjacent a side face of said pulley, said first disc being located between said pulley and plate; a first layer of a material of a high coefficient of friction carried by one of said side faces; a second disc surrounding said shaft, located between said first disc and plate, and having a side face directed toward and located adjacent a side face of said plate; a second layer of a material of a high coefficient of friction carried by one of the latter side faces; and a motion transmitting member connected to said shaft for rotation therewith and for free axial movement with respect thereto, said motion transmitting member being connected to said discs for rotation therewith and for free axial movement with respect thereto and said motion transmitting member being located between said discs and being operatively connected thereto for moving said first disc toward said pulley when said motion transmitting member moves toward said pulley and for moving said second disc toward said plate when said motion transmitting member moves toward said plate, whereby when said motion transmitting member moves toward said pulley a drive is transmitted from the latter to said shaft and when said motion transmitting member is moved toward said plate the rotation of the shaft is braked.

5. In a skiving machine, in combination, a feed roll drive shaft for driving a feed roll which feeds a workpiece with respect to a skiver; support means supporting said drive shaft for rotation about its axis; a pulley coaxial with and freely turnable with respect to said shaft;

a stationary plate spaced from said pulley and surrounding said shaft; a first disc surrounding said shaft and having a side face directed toward and located adjacent a side face of said pulley, said first disc being located between said pulley and plate; a first layer of a material of a high coefficient of friction carried by one of said side faces; a second disc surrounding said shaft, located between said first disc and plate, and having a side face directed toward and located adjacent a side face of said plate; a second layer of a material of a high coefficient of friction carried by one of the latter side faces; a motion transmitting member connected to said shaft for rotation therewith and for free axial movement with respect thereto, said motion transmitting member being connected to said discs for rotation therewith and for free axial movement with respect thereto and said motion transmitting member being located between said discs and being operatively connected thereto for moving said first disc toward said pulley when said motion transmitting member moves toward said pulley and for moving said second disc toward said plate when said motion transmitting member moves toward said plate, whereby when said motion transmitting member moves toward said pulley a drive is transmitted from the latter to said shaft and when said motion transmitting member is moved toward said plate the rotation of the shaft is braked; and spring means cooperating with said discs and motion transmitting member for providing the energy for urging said discs respectively toward said pulley and plate.

6. In a skiving machine, in combination, a feed roll drive shaft for driving a feed roll which feeds a work-piece with respect to a skiver; support means supporting said drive shaft for rotation about its axis; a pulley coaxial with and freely turnable with respect to said shaft; a stationary plate spaced from said pulley and surrounding said shaft; a first disc surrounding said shaft and having a side face directed toward and located adjacent a side face of said pulley, said first disc being located between said pulley and plate; a first layer of a material of a high coefficient of friction carried by one of said side faces; a second disc surrounding said shaft, located between said first disc and plate, and having a side face directed toward and located adjacent a side face of said plate; a second layer of a material of a high coefficient of friction carried by one of the latter side faces; a motion transmitting member connected to said shaft for rotation therewith and for free axial movement with respect thereto, said motion transmitting member being connected to said discs for rotation therewith and for free axial movement with respect thereto, and said motion transmitting member being located between said discs and being operatively connected thereto for moving said first disc toward said pulley when said motion transmitting member moves toward said pulley and for moving said second disc toward said plate when said motion transmitting member moves toward said plate, whereby when said motion transmitting member moves toward said pulley a drive is transmitted from the latter to said shaft and when said motion transmitting member is moved toward said plate the rotation of the shaft is braked; spring means cooperating with said discs and motion transmitting member for providing the energy for urging said discs respectively toward said pulley and plate; and means capable of being actuated by the operator of the machine and cooperating with said spring means for controlling the latter to urge said discs selectively toward said pulley and plate, respectively.

7. In a machine as recited in claim 4, said shaft being formed intermediate its ends with a cutout through which said motion transmitting member passes and said shaft being formed with an axial bore extending from an end thereof to said cutout and passing through a part of said shaft which is surrounded by said pulley; a leaf spring located between said motion transmitting member and first disc and urging the latter away from said motion

transmitting member toward said pulley; a second spring cooperating with said second discs for urging the latter away from said plate; a push rod extending slidably through said bore of said shaft, having one end in engagement with said leaf spring and having an opposite end located beyond said shaft; a bell crank pivotally carried by said support means and having one arm which cooperates with said opposite end of said push rod; a third spring stronger than the total of the forces of said leaf spring and second spring cooperating with the other arm of said bell crank for urging said one arm thereof toward said end of said shaft; and means capable of being actuated by the operator for turning said bell crank against the influence of said third spring in a direction which frees said first and second discs to the influence of said leaf spring and second spring, respectively, said third spring urging said second disc toward said plate.

8. In a machine as recited in claim 7, said means capable of being actuated by the operator including elongated rod means of adjustable length connected to said other arm of said bell crank and tiltable pedal means adapted to rest on the floor and operatively connected to said elongated rod means for compressing the latter when said pedal means is actuated by the operator to turn said bell crank against the force of said third spring.

9. In a machine as recited in claim 8, releasable catch means cooperating with said pedal means for maintaining the latter in an end position where said discs are fully released to the action of said leaf spring and second spring, respectively.

10. In a machine as recited in claim 4, said pulley surrounding said shaft and the latter having a free threaded end portion located beyond said pulley on the side thereof opposite from said first disc, said second disc having a hub extending into said first disc and terminating in an end face directed toward said pulley; a bearing carried by said shaft and supporting said pulley for free rotation thereon, said bearing having an inner race slidably engaging said shaft; a coil spring surrounding said shaft, bearing with one end against said end face of said hub, and bearing with its opposite end against an end face of said inner race which is directed toward said hub; and a nut threadedly engaging said end portion of said shaft and bearing against an opposite end face of said inner race which is directed away from said hub, whereby said spring prevents said nut from turning with respect to said shaft during rotation of the latter and whereby said nut may be turned with respect to said shaft to adjust the distance between said pulley and first disc.

11. In a machine, in combination, a drive shaft; support means supporting said drive shaft for rotation about its axis; a pulley coaxial with and freely turnable with respect to said shaft; a disc member and a block member coaxial with said shaft and being axially shiftable with respect to each other while constrained to rotate together, one of said members being axially shiftable with respect to said shaft while being constrained to rotate therewith, said disc member having a side face directed toward and located adjacent a side face of said pulley; a layer of material of a high coefficient of friction carried by one of said side faces so that when the other of said side faces presses against said layer the rotation of said pulley will be transmitted to said disc member so as to rotate said shaft; first spring means operatively connected to said block member for urging the same toward said pulley; second spring means located between and freely abutting against said members, said second spring means being weaker than said first spring means and being increasingly compressed when said first spring means moves said block member toward said pulley; and operator controlled positioning means movable between a plurality of positions in which said position means is operatively connected to said block member for adjusting the distance of said block member from said pulley against the force of said first spring means and an end position in which

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said positioning means is disconnected from said block member and frees the latter for movement against said pulley, whereby as long as said positioning means is operatively connected to said block member the pressure of said other side face against said layer will be determined only by the extent to which said second spring means is compressed.

12. In a machine, in combination, a drive shaft; support means supporting said drive shaft for rotation about its axis; a pulley coaxial with and freely turnable with respect to said shaft; a disc member and a block member coaxial with said shaft and being axially shiftable with respect to each other while constrained to rotate together, one of said members being axially shiftable with respect to said shaft while being constrained to rotate therewith, said disc member having a side face directed toward and located adjacent a side face of said pulley; a layer of material of a high coefficient of friction carried by one of said side faces so that when the other of said side faces presses against said layer the rotation of said pulley will be transmitted to said disc member so as to rotate said shaft; first spring means operatively connected to said block member for urging the same toward said pulley; second spring means located between and freely abutting against said members, said second spring means being weaker than said first spring means and being increasingly compressed when said first spring means moves said block member toward said pulley; and operator controlled positioning means movable in axial direction of said shaft between a plurality of positions in which said position means is operatively connected to said block member for adjusting the distance of said block member from said pulley against the force of said first spring means and an end position in which said positioning means is disconnected from said block member and frees the latter for movement against said pulley, whereby as long as said positioning means is operatively connected to said block member the pressure of said other side face against said layer will be determined only by the extent to which said second spring means is compressed.

13. In a machine, in combination, a drive shaft; support means supporting said drive shaft for rotation about its axis; a pulley coaxial with and freely turnable with respect to said shaft; a disc member and a block member coaxial with said shaft and being axially shiftable with respect to each other while constrained to rotate together, one of said members being axially shiftable with respect to said shaft while being constrained to rotate therewith, said disc member having a side face directed toward and located adjacent a side face of said pulley; a layer of

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material of a high coefficient of friction carried by one of said side faces so that when the other of said side faces presses against said layer the rotation of said pulley will be transmitted to said disc member so as to rotate said shaft; first spring means operatively connected to said block member for urging the same toward said pulley; second spring means located between and freely abutting against said members, said second spring means being weaker than said first spring means and being increasingly compressed when said first spring means moves said block member toward said pulley, said second spring means being in the form of a leaf spring having a characteristic which gradually increases the pressure of said other side face against said layer during the greatest part of the compression of said second spring means and which suddenly increases said pressure to its final value during a final relative smaller fraction of said compression; and operator controlled positioning means movable between a plurality of positions in which said position means is operatively connected to said block member for adjusting the distance of said block member from said pulley against the force of said first spring means and an end position in which said positioning means is disconnected from said block member and frees the latter for movement against said pulley, whereby as long as said positioning means is operatively connected to said block member the pressure of said other side face against said layer will be determined only by the extent to which said second spring means is compressed.

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