Oct. 4, 1932. C. E. DUNLAP 1,880,910

PROCESS AND APPARATUS FOR BEVELING TIRE PATCHES

Filed March 16, 1931 4 Sheets-Sheet 1

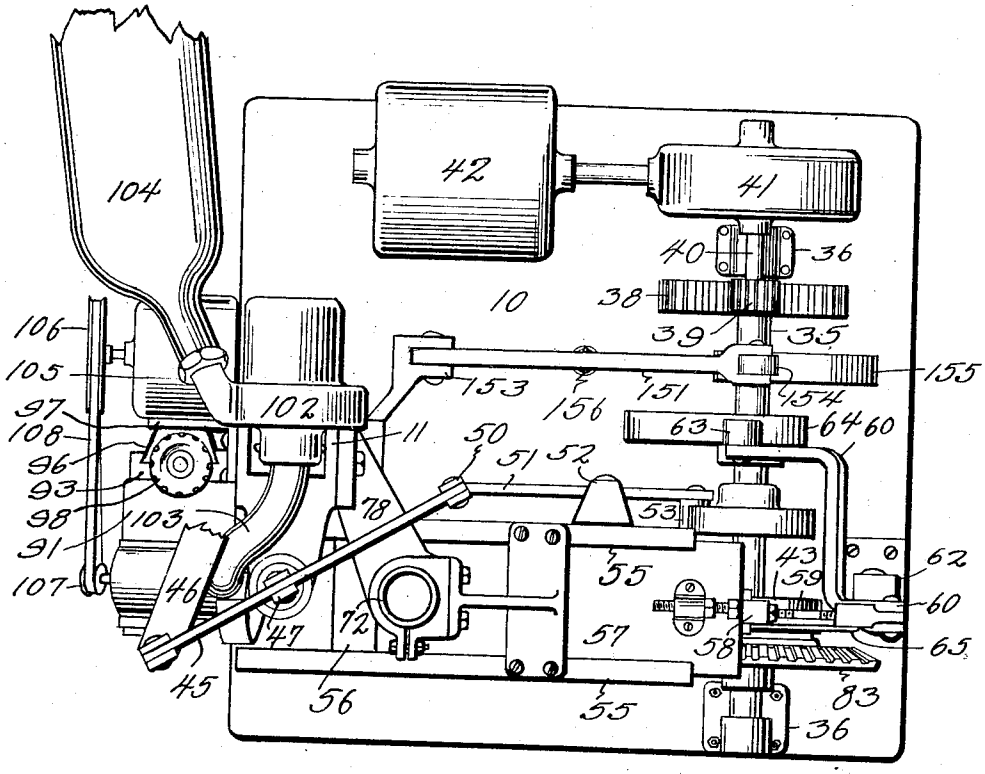



Fig. 1

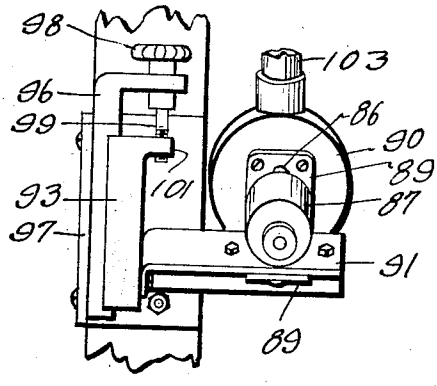



Fig. 2

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PROCESS AND APPARATUS FOR BEVELING TIRE PATCHES

Filed March 16, 1931 4 Sheets-Sheet 2

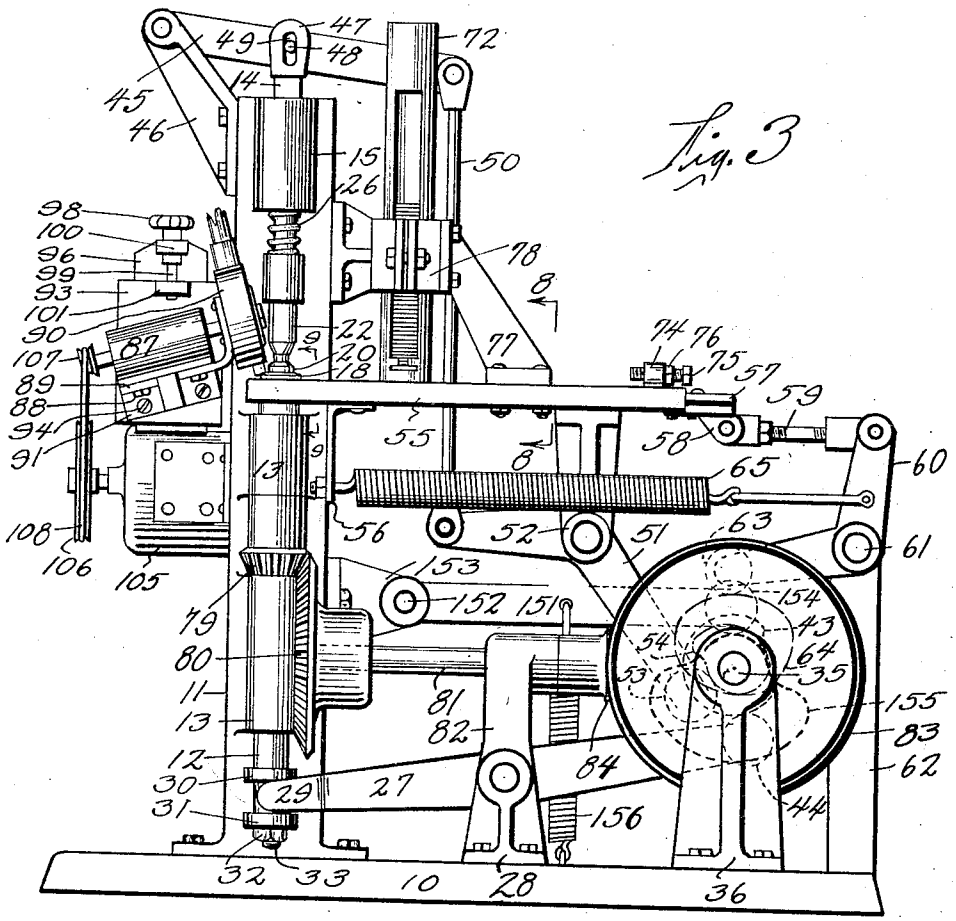



Fig. 3

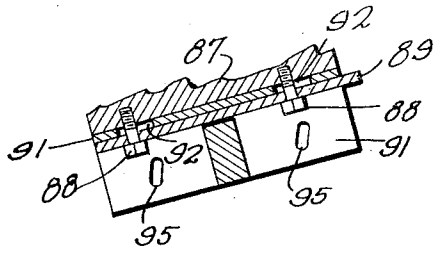



Fig. 4

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PROCESS AND APPARATUS FOR BEVELING TIRE PATCHES

Filed March 16, 1931 4 Sheets-Sheet 3

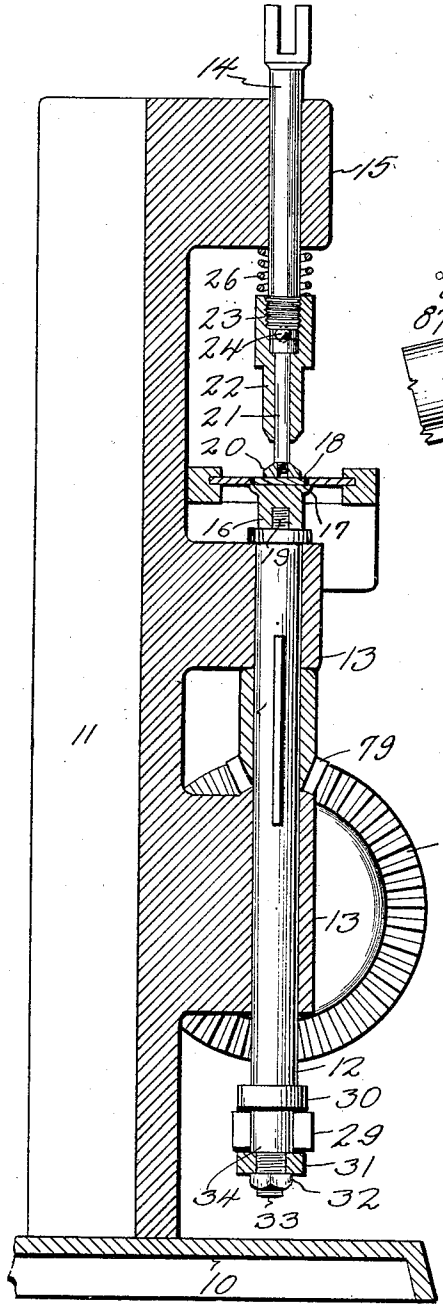



Fig. 5

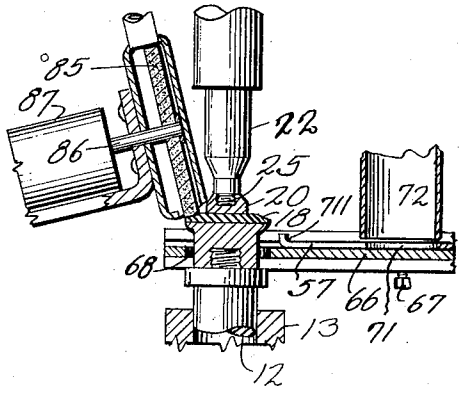



Fig. 6

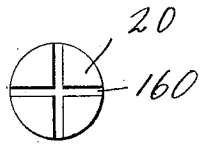



Fig. 7

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PROCESS AND APPARATUS FOR BEVELING TIRE PATCHES

Filed March 16, 1931 4 Sheets-Sheet 4

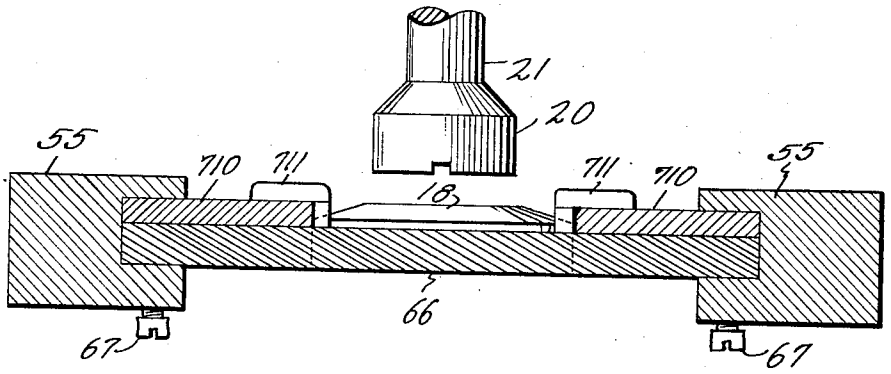



Fig. 9

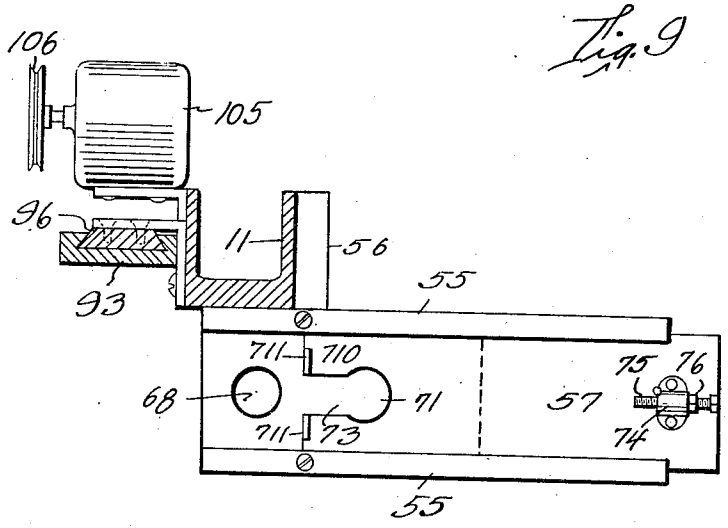



Fig. 10

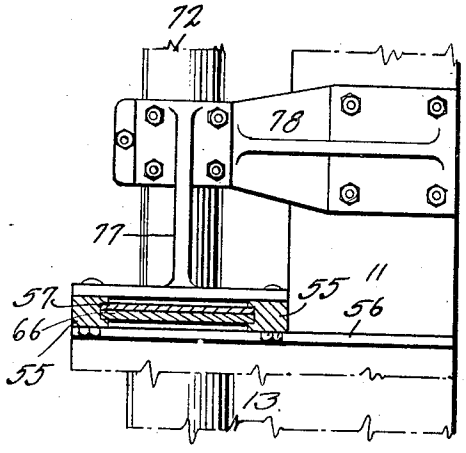



Fig. 8

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Patented Oct. 4, 1932 1,880,910

# UNITED STATES PATENT OFFICE

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## PROCESS AND APPARATUS FOR BEVELING TIRE PATCHES

Application filed March 16, 1931. Serial No. 523,053.

My invention relates to the making of round tube patches of the beveled edge type.

Generally, the objects of my invention are to produce an improved method for beveling patches of this kind and to produce an improved machine for the automatic beveling thereof.

Prior methods of producing beveled patches have involved what is known as the "skiving" process.

My process is carried out generally by subjecting the edge of a blank to be beveled to a grinding or buffing operation of an abrasive wheel rotating at a high rate of speed.

Another object of my invention is to provide a method of subjecting the blank to the buffing operation without allowing the friction of the buffing wheel to affect the seating of the blank on the working head which carries it. This is a problem of some importance, due to the soft and yielding nature of the rubber employed in the ordinary tube patch. The solution of this problem is found in the method of rotating the blank and the buffing wheel in such relative directions that their peripheries at the point of contact are moving in the same direction.

More specifically, it is my intention to provide a machine having means for feeding round blanks of the patch rubber from a magazine to a working head carried upon a spindle, means for rotating the spindle, means for holding the blank upon the working head, means for elevating and lowering the spindle and holding means, and a grinding or buffing wheel.

My invention deals particularly with the problem of the discharge of the patch from the machine after it has been beveled. This problem has been found to be a most difficult one in connection with a machine of this character. The solution of the problem has involved first, cutting down the speed of rotation of the buffing wheel to a speed considerably below that customary for small grinding wheels, in order to decrease the suction of the wheel to a point where there will be no tendency to lift the patch from its supporting surface after the hold-down spindle has pulled away from the patch.

Another phase of the discharge problem has been that of pushing the patch away from the spindle assembly. Previously, the patch has been discharged by exerting an edgewise push thereagainst from the next succeeding blank being fed into position between the spindles. Due to the very small edge which remains on the finished patch after it has been beveled however, it is quite easy for the new blank to ride upon the finished patch, slipping upwardly by virtue of the beveled edge, instead of pushing the finished patch out of the machine. My invention has as one of its objects to solve this problem of positively discharging one patch from the machine while simultaneously feeding another blank into working position.

The solution of this problem has involved the provision of means on the feed plate for positively engaging the finished patch and for pushing it out of the machine without any contact between the finished patch and the next succeeding blank.

This has created another problem however, namely that of the possible undesirable engagement between the lower spindle and the feed plate should the feed plate accidently become out of time with the rest of the machine, and my invention aims to remedy this problem also.

A further object is to provide a simple arrangement for operating the various parts of the machine from a single cam shaft in controlling the movements of the parts.

A further object is to accomplish the above results in a machine of simple, durable, and inexpensive construction.

With these and other objects in view, my invention consists in the construction, arrangement, and combination of the various

parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of the machine,

Figure 2 is a side elevation of the grinding wheel support,

Figure 3 is a front elevation of the machine,

Figure 4 is a detail, sectional view through the grinding wheel bracket,

Figure 5 is a detail, sectional view through the working table, grinding wheel casing, and associated parts,

Figure 6 is a central, sectional view through the spindle assembly,

Figure 7 is an inverted, plan view of the working face of the upper spindle,

Figure 8 is a detail, sectional view taken on the line 8—8 of Figure 3,

Figure 9 is a detail, sectional view taken on the line 9—9 of Figure 3, and

Figure 10 is a sectional view showing the working table in plan.

I have used the reference character 10 to indicate generally the base of the machine of my invention, on which are mounted the various parts of the machine. Secured to the base 10 is the post 11, which may be channel-shaped in cross section, as shown, and which supports a majority of the working parts of the machine.

The lower spindle or feed spindle 12 is journalled in a pair of brackets 13, secured to the post 11 and the upper spindle or hold-down spindle 14, is journalled in a bracket 15, secured to the post 11.

The spindle 12 is provided with a working cap 16, having a working head 17, adapted to support a blank of patch rubber 18.

The cap 16 is threaded onto a threaded shank 19, formed on the spindle 12 and may be removed for replacement by a working cap of different size.

The hold-down spindle 14 is provided with a working head 20 on one end of a shaft 21, journalled within a collar 22, which is threaded onto the threaded end 23 of the spindle 14.

The ball bearing 24 acts as a thrust bearing between the spindle 14 and the shaft 21 to allow the shaft 21 to turn freely under pressure.

The working head 20 is removably secured to the end of the shaft 21 by threading upon the threaded shank 25 thereof. Different sizes of working heads 20 are employed for different sizes of blanks.

A coil spring 26, compressed between the bracket 15 and the collar 22 urges the working head 20 against the blank 18 to hold it securely against the working head 17 during the working operation.

The feed spindle 12 is moved vertically by a rocker arm 27, (Figure 3), fulcrumed on a bracket 28 secured to the base 10, and is provided with a fork 29, engaged between a shoulder 30 and a removable collar 31 on the lower end of the spindle 12. A nut 32 is threaded upon the reduced shank 33 of the spindle to hold the collar 31 in place against the shoulder 34.

A cam shaft 35 is journalled in bearings 36 on the base 10 and at its rear end is provided with a gear 38, meshing with a pinion 39 on the shaft 40 of a reduction gear 41. The reduction gear 41 is a conventional type of worm gear mechanism for reducing the rate of revolution of a motor 42.

A cam 43, (shown in light dotted lines), on the cam shaft 35 engages a cam roller 44 on the rocker arm 27 to provide oscillating movement for the rocker arm. It will now be seen that when the rocker arm 27 is moved downwardly by the cam 43 that the fork 29 will move the spindle upwardly and that when the cam 43 recedes from the rocker arm 27 that the spindle 12 will slide downwardly under its own weight and will carry the rocker arm with it.

For lifting the upper spindle, I provide a lever 45 fulcrumed on a bracket 46, secured to the post 11, extending through a fork 47 on the upper end of the spindle 14 and provided with a pin 48, which travels in slots 49 in the fork 47.

The end of the lever 45 opposite its fulcrum is connected by means of a link 50 to one arm of a lever 51 fulcrumed on a bracket 52 provided with a roller 53, engaging a cam 54 on the cam shaft. The cam 54 is shown by a dot and dash line.

The feed table includes a pair of guide channels 55, secured to an angle-iron bracket 56, which is in turn secured to the post 11. Between the channels 55 is slidably mounted a feed plate 57, which is connected by means of a bracket 58 and an adjustable link 59 to a bell crank lever 60, which is fulcrumed at 61 upon a bracket 62 secured to the base 10. The bell crank lever 60 is provided with a roller 63, engaging a cam 64, (shown in broken lines), on the cam shaft 35. A spring 65 is connected at one end to the lever 60 and at its other end to the bracket 56.

When the cam 64 raises the lever 60, the feed plate will be retracted. When the cam moves away from the lever, the spring 65 will advance the feed plate.

The feed plate 57 slides upon a bed plate 66, which is supported in the channels 55 as shown in Figure 9, secured in place by set screws 67, and removable for replacement. In this connection, it may be stated that the feed plate and bed plate will need occasional replacement for the reason that they cannot be lubricated except by an occasional application of gasoline to dissolve the accumulated rubber particles. Since the feed plate must slide upon the bed plate without lubrication,

the constant friction will ultimately wear these plates sufficiently so that they will have to be replaced.

The bed plate 66 is long enough so as to extend beneath the magazine 72, and is provided with an opening 68 to receive the lower spindle head 16.

The blanks 18 are fed from the magazine 72, the lower edge of which rests closely adjacent the upper surface of the feed plate 57. The feed plate is provided with a slot 73 at its forward end, having an enlargement 71 shaped to fit the contour of the blank to be fed and positioned so that when the feed plate is in its retracted position, the blank will drop into the slot and onto the bed plate 68. (See Figure 6.) The cam 64 is provided with sufficient throw to move the feed plate from the position just mentioned to a position wherein the blank will be accurately centered on the working head 17.

The prongs 710 (Figure 10) formed in the feed plate by the slot 73, are bent upwardly at their forward ends to provide fingers 711 to engage the patch 18 after it has been lowered to the level of the feed plate after beveling, and to push it out of the machine.

To this end, the forward portion of the slot 73, between the fingers 711, is narrower than the diameter of the patch. (See Figure 9.)

Should the feed plate, in any way, get out of time with the rest of the machine, there would be a possibility of the plate being pushed against the cap 16 while the latter was in a raised position. Since the diameter of the working head 17 must be slightly greater than the diameter of the blank 18, it would be possible for the prongs 710 of the feed plate to come into contact with the cap 16 if it were as large in diameter as the working head 17. In order to eliminate any possibility of jamming the machine, the cap 16 is reduced in diameter so as to be smaller than the width of the slot, and the head 17 is formed as a relatively thin, annular rim formed on the cap 16. This rim is beveled somewhat so that if the fingers 711 should contact with it, they would simply push the head upwardly out of the way.

The advancing movement of the feed plate may be accurately controlled by a stop device including a lug 74, secured to the feed plate and a set screw 75, threaded therethrough and provided with a lock nut 76. The set screw 75 is adapted to engage a portion of a bracket 77, which is secured to the guide channels 55 to support the channels. The bracket 77 in turn is supported by a bracket 78, in which is mounted the magazine 72. The set screw 75 accurately limits the movement of the feed plate toward the spindle axis and the link 59 may be adjusted to correspond.

Rotation is given to the supporting spindle by means of a bevel pinion 79, meshing with a bevel gear 80, carried by a drive shaft 81, journalled in a bracket 13 and a bearing 82, forming part of the bracket 28.

A bevel gear 83 on the cam shaft 35 drives a bevel pinion 84 on the shaft 81.

The pinion 79 is splined to the spindle 21, as shown in Figure 5, allowing the spindle to slide.

The grinding or buffing mechanism includes a wheel 85, mounted on a grinding wheel shaft 86, journalled in a high speed bearing 87. This bearing is of any conventional type, such as the ball bearing variety. The bearing is secured by screws 88 to a bracket 89 which supports a wheel housing 90.

Thus the wheel and wheel housing are mounted fixedly relative to each other.

The wheel and housing are in turn mounted on a bracket 91, on which they may be adjusted in the direction of the axis of the wheel shaft. The bracket 91 is interposed between the housing bracket 89 and the bearing 87, and the screws 88 pass through elongated openings 92 in the bracket 91. (Figure 4.) Tightening the bolts 88 locks the brackets 89 and 91 in fixed relation.

By moving the wheel axially, it may be adjusted to cut blanks of varying diameters.

Tilting of the wheel axis to varying angular positions, may be attained by the slotted connection between the bearing bracket 91 and the sliding bracket 93 on which the bearing bracket is mounted. This slotted connection includes screws 94 extending through slots 95 in the bearing bracket 91 and into the sliding bracket 93. The angle at which the wheel cuts is adjusted by this angular adjustment of the wheel axis.

Vertical adjustment of the wheel 85 is accomplished by sliding the bracket 93 vertically on a slide 96, on which it is slidably mounted. The slide 96 is secured to the post 11 by a bracket 97, secured to the slide, and shown in Figure 2.

A hand wheel 98 has a shaft 99 journalled in a bearing 100 on the slide 96, and is threaded into an ear 101 on the bracket 93. Rotation of the hand wheel will cause the bracket 93 to move vertically.

Dust from the grinding wheel is removed by a blower 102, supported on the top of the post 11, connected to the wheel housing 90 by a suction hose 103, and at its discharge end, to a porous bag 104, of the type employed in vacuum cleaners.

Power for the wheel 85 is furnished by a motor 105, and transmitted by pulleys 106 and 107 on the motor and wheel shafts respectively, and a belt 108 connecting the pulleys. The pulleys are arranged to step up the speed of the motor several times, and the wheel speed, for the best results, is about 3000 revolutions per minute.

In the operation of the machine, the blanks

are fed from the magazine 72 onto the feed plate 57, and as the plate attains its retracted position, one blank will drop into the slot 73 of the plate. When the plate is advanced, the blank will be carried forwardly to the working head 16, the support spindle being at the time in its lowered position. As soon as the blank is positioned, the support spindle will commence to elevate, proceeding relatively rapidly, until the blank touches the wheel, and thence proceeding slowly until the grinding operation is finished.

The length of time occupied by a complete cycle of movement of the various parts of the machine is about five seconds. The grinding operation occupies approximately ¾ of a cycle, or a little over three seconds. (Note the shape of the cam 43.) This time might be reduced by improvement of other features of the machine, but at the present time appears to be necessary.

Considerable difficulty has been experienced in grinding or buffing the corner of a round blank held between two rotating spindles. Due to its nature, the rubber has a tendency to yield under the force of the grinding wheel, and some times to be stretched from its proper position. Should the blank commence to yield, it will be pushed out of position and cut to ribbons by the wheel.

I have found that this difficulty occurs especially when the wheel and spindle are rotated in directions such that the peripheries of wheel and blank are moving in opposite directions at the point of contact, and that by rotating them to move the peripheries in the same direction at the point of contact, the machine may be made to operate successfully.

Why this should be true, is not apparent, the fact having been discovered by experiment. It may be due to the different angles at which the cutting force is applied to the uncut portions of blanks rotated in opposite directions.

The hold-down spindle is timed to descend just after the blank has been positioned, and to grip the blank just before the support spindle commences to rise. The descent of the lever 45 allows the upper spindle to descend, and the lever then remains down while the upper spindle is pushed upwardly by the rising support spindle. Before the finish of the working operation however, the lever 45 rises, stopping at a position short of where it would engage the upper spindle, catching the upper spindle as it descends with the lower spindle, and holding it in the position where it is caught until the next blank is in place on the working face 17, when it again allows the hold-down spindle to descend to engage the blank.

Thus the patch is carried forcibly downwardly between the spindles, until it has been removed from the immediate vicinity of the wheel 85. This is important, as the air current created by the rapidly revolving periphery of the wheel tends to move the patch away from its centered position, and the suction from the blower has a tendency to hold the patch near the wheel.

This latter difficulty has caused much trouble in the operation of the machine. It has been found however, that by reducing the speed of the wheel from 10,000 R. P. M., the speed originally given it, to about 3000 R. P. M., that the objection is eliminated.

Simultaneously with the pushing of a finished patch from the machine, a new blank of rubber is positioned over the working head 17 by the feed plate. The cycle of operations already described is then repeated.

The distance between the enlargement 71 and the fingers 711 is such that there can be no contact between the finished patch and the blank and thus no danger of one becoming wedged upon the other. In experimenting with this machine, I previously used the contact between the edge of the new blank and the edge of the finished patch to push the finished patch from the machine. Extreme difficulty was encountered with the jamming of the blanks in the machine, and it was necessary each time that a pair of blanks became jammed to stop the machine and pry them loose before it could be continued. This required the constant care of an operator and whereas originally a single machine would occupy the entire attention of one workman, with the machine in its preferred form as herein described, it is possible for one workman to watch a half a dozen machines and still have plenty of time to perform other duties.

In order to counterbalance the strong pull of the spring 65, I provide a brake including a lever 151, pivoted at 152 on a bracket 153 secured to the post 11 and provided with a roller 154 riding upon a cam 155, shown in heavy dotted lines, and urged against the cam by a spring 156 which is so adjusted that when the roller 154 is riding on the low portion of the cam, there is practically no pressure against the cam, whereas, while the roller is riding up the incline from the low to the high portion of the cam, the spring 156 will strongly resist the forward movement of the shaft 35.

The cam 155 is so timed with the other cams that this resistance to the forward rotation of the shaft 35 occurs simultaneously with the descent of the roller 63 from the high portion to the low portion of the cam 64. Without the retarding action of the brake, this descent of the roller 63 on the cam 64 would cause the shaft 35 to jerk ahead rapidly to take up all of the slack in the various gears between the cam shaft and the motor 42. This jerking movement is undesirable since it advances the feed plate too rapidly and

tends to disintegrate the machine much more rapidly than is necessary. The retarding action of the brake solves this problem.

The adjustment of the wheel 85 makes it possible to cut patches having bevels of varying pitch, and varying depth, and to cut patches of varying diameters.

It may be noted that my machine is adapted to automatically handle a circular blank of rubber, taking it from a magazine and depositing it in a receptacle after working upon it.

As far as I am aware, no one has ever before demonstrated that a circular blank of rubber may be given a beveled edge by means of a buffing or grinding operation, and I consider it to be part of my invention to have discovered and demonstrated a successful process embodying this principle.

My invention is applicable to casing patches as well as tube patches.

It is desirable that the blanks be rotated several times during each cycle of movement of the machine, in order that each blank may turn upon its axis several times during the single buffing operation involving it, and to this end, the speed of rotation of the spindle 12 is stepped up over that of the cam shaft, by means of the gears 79, 80, 83, and 84.

Suction between the patch and the working head 20 is dispelled by grooves 160 in the head 20.

The arrangement of the reduction gear 41, the motor 42, the cam shaft 35, and the post 11, is such that a square base of relatively small dimensions will accommodate them. This is due to the arrangement in the form of a square, and this arrangement is also ideal for the proper co-ordination of the cam-operated devices and the working spindles.

Some changes may be made in the construction and arrangement of the parts of my invention without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a machine for beveling rubber blanks, a grinding wheel, a pair of spindles adapted to carry between them a blank to be beveled, to and from the wheel, a feed plate, guides in which said feed plate is slidably mounted for movement transverse to the axes of the spindles, a magazine to hold rubber blanks, positioned vertically over the feed plate, its lower end open and closely adjacent the plate, a recess in the feed plate to receive a blank, a bed plate under the feed plate to support a blank, the spindles being positioned vertically and the lower one having a working face adapted to register with the bed plate, means to advance the feed plate while the lower spindle is in that position, a spring to urge the upper spindle against the blank, means to check downward movement of the upper spindle during positioning of the blank on the working face, and means to raise the lower spindle, and with it, the blank and upper spindle, against the action of the spring.

2. A machine for beveling tire patch blanks comprising a rotatable supporting spindle, a rotatable hold-down spindle, a feed plate slidable transversely of said spindles, individually controlled means for elevating the supporting spindle, for elevating the hold-down spindle, and for sliding the feed plate, comprising levers connected to the respective spindles and plate, and means for controlling said means, comprising a motor, a reduction gearing device driven by the motor, a slow speed shaft driven by the reduction gearing device, separate cams on said shaft for engaging the levers, and ascending ratio gearing connecting the shaft with the supporting spindle to transmit rotating movement thereto.

3. In a machine for beveling rubber blanks, a grinding wheel, a pair of spindles adapted to carry between them, to and from the wheel, a blank to be beveled, said spindles being positioned vertically and the lower one having a working face positioned in a horizontal plane, a feed table positioned horizontally and adjacent the lower spindle, means to move the lower spindle so that its working face passes the level of the feed table, and means to slide a blank from the working table onto the working face of the spindle.

4. In a machine for beveling rubber blanks, a grinding wheel, a pair of spindles adapted to carry between them, to and from the wheel, a blank to be beveled, said spindles being positioned vertically and the lower one having a working face positioned in a horizontal plane, a feed table positioned horizontally and adjacent the lower spindle, means to move the lower spindle so that its working face passes the level of the feed table, and means to slide a blank from the working table onto the working face of the spindle, said means for sliding the blank being adapted, at its limit of movement in one direction, to position the blank substantially co-axial with the spindles.

5. In a machine for beveling rubber blanks, a grinding wheel, a pair of spindles adapted to carry between them, to and from the wheel, a blank to be beveled, said spindles being positioned vertically and the lower one having a working face positioned in a horizontal plane, a feed table positioned horizontally and adjacent the lower spindle, means to move the lower spindle so that its working face passes the level of the feed table, means to slide a blank from the working table onto the working face of the spindle, and means for

moving the upper spindle into engagement with the blank after the latter has been positioned on the working face.

6. In a machine for beveling rubber blanks, a grinding wheel, a pair of spindles adapted to carry between them, to and from the wheel, a blank to be beveled, said spindles being positioned vertically and the lower one being provided with a horizontal working face at its upper end, means to support and carry a blank of material in a horizontal direction and thence to slide said blank upon the horizontal working face of the lower spindle, means to move the lower spindle upwardly so that its working face approaches the means for moving the blank horizontally at the time when the blank is close to the spindle.

7. In a machine for beveling rubber blanks, a grinding wheel, a pair of spindles adapted to carry between them, to and from the wheel, a blank to be beveled, said spindles being positioned vertically and the lower one having a working face positioned in a horizontal plane, a feed table positioned horizontally and adjacent the lower spindle, means to move the lower spindle so that its working face passes the level of the feed table, means to slide a blank from the working table onto the working face of the spindle, and a magazine to hold the blanks, positioned vertically over the feed table, its lower end open and closely adjacent the table.

8. In a machine for beveling rubber blanks, a grinding wheel, a pair of spindles adapted to carry between them, to and from the wheel, a blank to be beveled, a feed table positioned horizontally and adjacent the lower spindle, a feed plate mounted thereon for reciprocating movement in a horizontal direction, said plate being provided at its forward end with a forwardly opening recess to receive a blank, means for giving movement to the plate such as to slide the blank upon the working face of the lower spindle, the side edges of the recess serving to position the blank laterally and the rear edge of the recess serving to push the blank and to position it in the direction of feeding movement on the working face of the lower spindle, and means for moving the lower spindle to bring the working face near the level of the table at the same time that the blank is fed beyond the table by the feed plate.

9. In combination, a spindle movable axially to carry a blank to a working tool, a feed plate positioned in a plane perpendicular to the axis of the spindle and slidable on an axis intersecting the spindle, said plate being provided with an open ended slot positioned to receive the spindle and provided at its closed end with an enlargement to receive a blank, the width of the narrower portion of the slot being less than the diameter of a blank and the forward ends of the plate portions separated by said slot serving to push away from the spindle a blank which has been worked upon.

10. In a machine for beveling rubber blanks, a grinding wheel, a spindle movable axially and including a working head, to carry a blank to the wheel, a feed plate positioned perpendicularly to the axis of the spindle and slidable on an axis intersecting the spindle, said plate being provided with an open ended slot positioned to receive the spindle and provided at its closed end with an enlargement to receive a blank, the narrower portion of the slot being of less width than the diameter of a blank, the working head of the spindle being of greater diameter than said narrower slot portion, and the spindle adjacent said working head being of less diameter than the said slot portion.

11. In a machine for beveling rubber blanks, a spindle movable axially to carry a blank to a working tool, a feed plate slidable longitudinally in a plane perpendicular to the axis of the spindle and provided with an open ended slot positioned to receive the spindle, having at its closed end an enlargement to receive a blank, and forming in the end of the feed plate a pair of projecting, spaced prongs, the forward ends of said prongs being built at right angles to the plane of the plate to form kick-off fingers, and the spindle having a working head of greater diameter than the slot attached to a neck of reduced diameter small enough to be freely received in the narrower portion of said slot.

12. In combination, a feeding assembly for relatively thin, flat blanks comprising a feed table positioned horizontally, a feed plate of substantially the same thickness as a blank slidable upon said table and provided with an open ended slot to receive a blank, the mouth of the magazine being positioned close to the upper surface of the blank where the rear extremity of the slot in its rearward position of movement will substantially register with the mouth of the magazine, and a spindle movable axially in a direction perpendicular to the plane of the feed table and through the slot in the forward position of movement of the slot.

13. In combination, a work feeding assembly including a support, a pair of channeled guides secured thereon, a bed plate having its edges received in the grooves of said channeled guides and secured therein, and a feed plate slidably mounted upon said bed plate with its edges slidable in said grooves.

14. In a rubber patch beveling machine a grinding wheel, a pair of spindles including an upper and lower spindle adapted to carry between them a rubber blank to be beveled, to and from the wheel, means for feeding both the spindles to the wheel and part way from the wheel comprising levered means adapted

to force the lower spindle against the upper spindle, the upper spindle including a spring, said spring serving to force the upper spindle against the blank and secure the blank between the spindles, and means to arrest the movement of upper spindle away from the wheel to release the blank, said means comprising a cam-controlled element having a lost motion connection with the other spindle.

Signed at Sioux City, Iowa, this 14th day of March, 1931.

CLARENCE E. DUNLAP.