

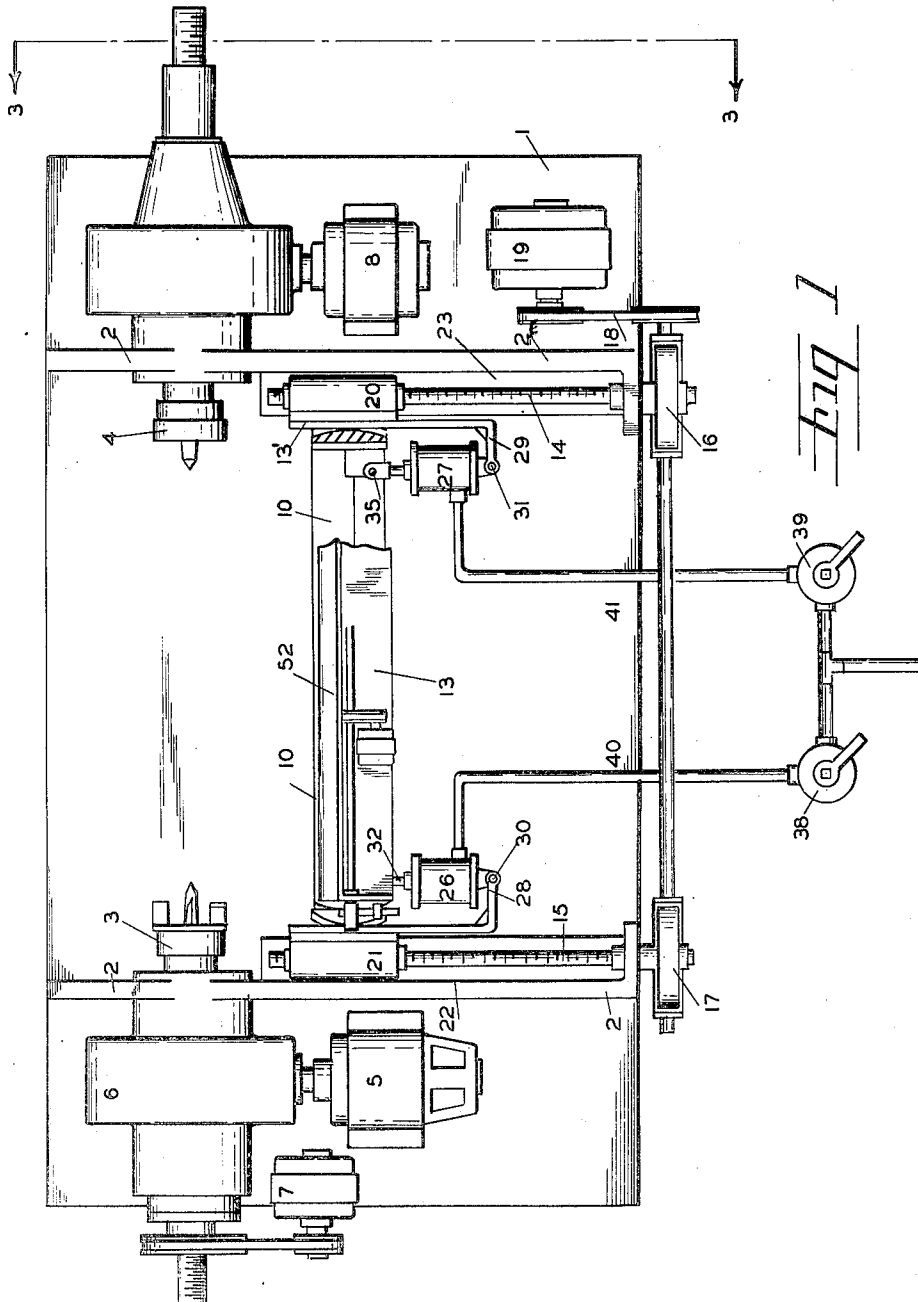
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G. HAUMANN
BARK REMOVING LATHE

2,534,671

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4 Sheets-Sheet 1



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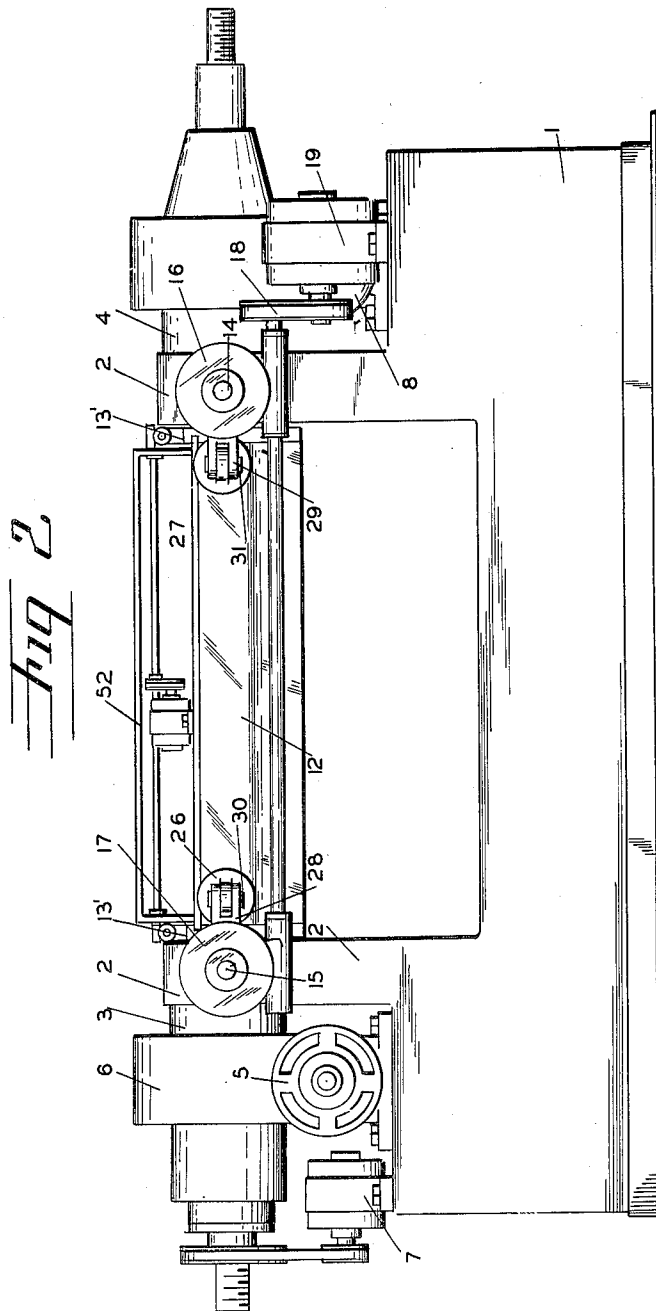
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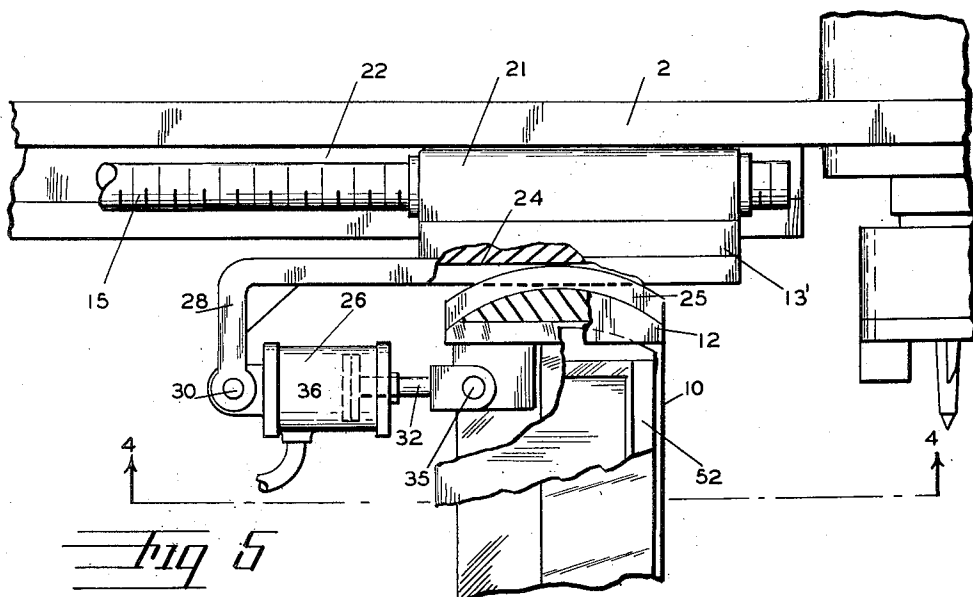
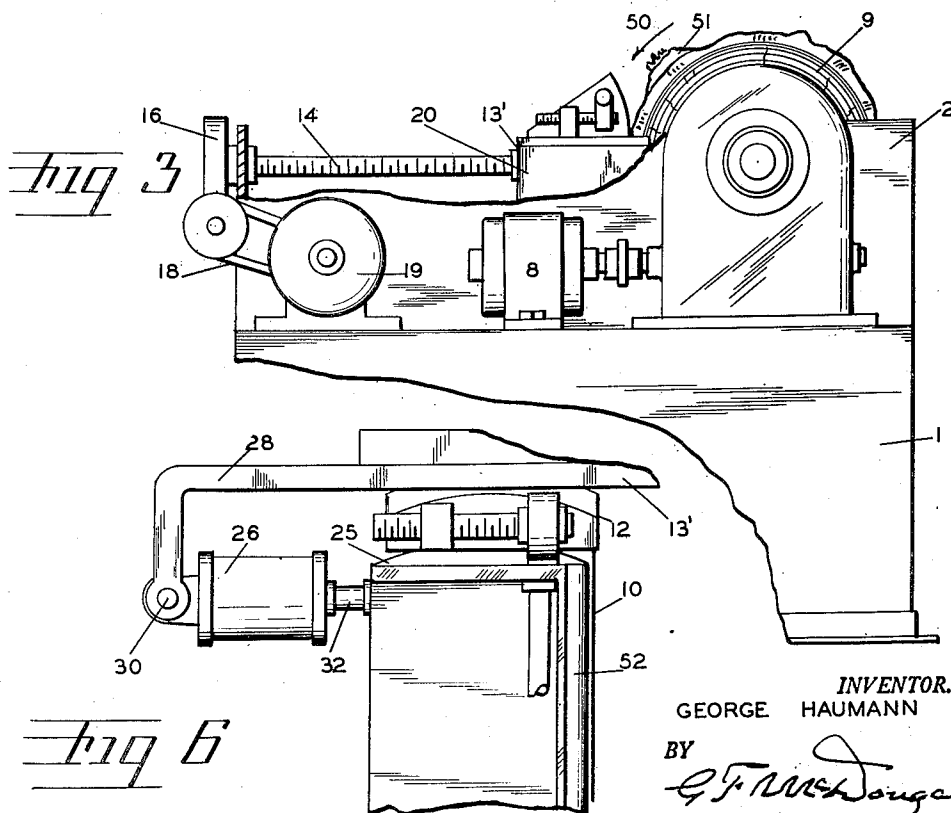
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BARK REMOVING LATHE

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11 Claims. (Cl. 144—209)

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This invention relates to a bark removing lathe, the same being a machine for preliminary barking and surfacing of a log, preparatory to placing it in a veneer lathe in the manufacture of veneer.

The object is to replace the conventional barkers that usually waste a considerable amount of the valuable white or sap wood, which in plywood manufacture is equally as valuable as the heartwood.

Another object of the invention is to "condition" the surface of a log, which means to reduce surface irregularities a shaving at a time as a knife can handle it, without wasting good material; meaning to provide a machine, which when barking preparatory to placing the log in a veneer lathe will, if a relatively high hump, knot or projection is encountered, automatically move the conditioning knife back and limit the bite or amount of cut it takes, to prevent stalling the machine or damaging the knife or its mounting, which otherwise might be expected, as some of the knots thus encountered are extremely hard.

Still another object is to provide manual controls whereby the knife can be made to align to the taper and irregular contour of the log.

The foregoing and other objects that will be apparent, are found in the specification and pointed out in the claims.

Drawings accompany and form a part hereof, showing an operative structure for carrying out the purposes of the invention. The drawings are as follows:

Fig. 1 is a plan view of the entire machine;

Fig. 2 is an elevation of the machine of Fig. 1;

Fig. 3 is a partially broken away side elevation on the plane 3—3, Fig. 1;

Fig. 4 is a sectional elevation taken from the plane 4—4, Fig. 5;

Fig. 5 is a fragmentary view in plan illustrating the piston control to be later described;

Fig. 6 is much the same as Fig. 5, it illustrates a bumper that is an important feature of the machine; and

Fig. 7 is a front elevation taken on the cutter blade, the carriage therefor and the means of mounting the same on the frame of the machine, partially in section taken on the plane 7—7, Fig. 4.

Describing the drawings in greater detail.

Numeral 1 represents a base that supports a frame 2. Revolvably mounted on the frame 2, is a headstock 3, and oppositely mounted is a tailstock 4, both of which need no description in de-

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tail. The headstock 3, is revolved by the motor 5, to which it is connected within the gear case 6, and both headstock and tailstock are movable by respective motors 7 and 8, to open up the distance between themselves to take in a log to be conditioned; indicated as present by numeral 9, Figs. 3 and 4, and closable to revolve the log in the well known manner. The lead blocks 20 and 21 are formed with cooperative integral guides 13' that work with relatively stationary parts 22 to preserve straight line operation.

The whole assembly so far described may be accurately regarded as the lathe portion of the log conditioner, the setting for the invention, and I will now proceed to describe the relatively stationary tool setup that conditions the log when it is revolved in the lathe and the tool is held against it to remove surface irregularities, and contains the novel structures that by their operation satisfy the objects of the invention.

The instrument that removes the irregularities referred to, is the knife blade 10, the bevel angle of which, 11, is shown to be tangent to the horizontal centerline of the log 9 in Fig. 4. The blade 10 is secured to the blade carrier 12, and the blade carrier 12, in turn, is rigidly mounted within the cutterhead 13. Numeral 13 has been chosen to designate the cutterhead as a whole, and includes the knife blade 10, the blade carrier 12 and other parts not specifically mentioned.

The cutterhead 13, is carried forward into engagement with a log of any diameter within the capacity of the machine by the lead screws 14 and 15, operated by the worm gear sets 16 and 17, said screws operable through the belt 18, by the reversible motor 19; and, as the lead screws revolve they may reciprocally move the lead blocks 20 and 21, which slide in contact with the guides 22 and 23 made on rigid parts of the frame 2, as shown in Fig. 1.

The following is a description of the cutterhead 13 and its mounting, which also incorporates a description of its mode of operation.

Leadscrews 14 and 15 are operatively mounted on the frame 2 to be revolved by worm wheels 16 and 17 operable by the reversible motor 19. The screws are threadably engaged with lead blocks 20 and 21 to advance and withdraw the cutterhead 13 with respect to the perimeter of a log.

The cutterhead 13 is indirectly connected to lead blocks 20 and 21 through the yokes 26 and 29; the yokes having straight portions which are rigid with the lead blocks and angularly bent

portions overhanging the ends of the cutterhead pivotally connected to air cylinders 26 and 27 at opposite ends by pivots 30 and 31. The air cylinders contain pistons (not shown) and have piston rods such as 32 in cylinder 26; both piston rods being pivotally connected to the cutterhead 13 by pivot pins such as 35 at the right of center, Fig. 1. The cylinders 26 and 27 are controllably energized through throttles such as 38 and 39 through the conduits 40 and 41.

The cutterhead 13 is supported at both ends by arcuate projecting ribs 25, swingable in straight slots 24 formed in the lead blocks 21 (or 20) and the lead blocks are concurrently movable by leadscrews 14 and 15, which in turn are operable by the reversible motor 19 operating through the belt 18 to drive the worm gear sets 16 and 17 connected to the leadscrews 14 and 15 as shown in Fig. 1.

The mode of operation will now be plain. The cutterhead is fed forward into contact with a log to be conditioned by bringing the edge of the knife 11 into tangential contact by operation of the leadscrews 14 and 15 after the well understood feed of a lathe. The leadscrews move the whole cutterhead assembly, as shown in Fig. 1, but unlike a lathe, the air cylinders 26 and 27, when charged with air under pressure, provide a resilient cushion, the yielding of which can modify shocks occasioned by hitting very hard knots.

The cutterhead is floatingly held with respect to the horizontal plane but prevented from varying in the vertical aspect by the ribs and slots previously mentioned. By skillful variation of the air pressure in the cylinders 26 and 27, the operator will be able to make knife contact with a log surface that takes the natural taper of the log into consideration, if this is expedient, and at the same time his operation of the air cylinders will not detract from the effectiveness of the bumper 52 when it is contacted by a protuberance or knot, such as 51 (Fig. 4) to prevent overloading the knife. The knot will strike the bumper and force the cutterhead back so that the knife takes a moderate cut and removes the knot by a succession of cuts without wasting valuable timber.

By virtue of the pivots 30, 31 and 35, with a corresponding one on piston rod 32 and the conduits 40 and 41, the movement of the cutterhead 13, in a horizontal plane only, is well provided for.

Several modes of operation of the cutterhead will be at once apparent. The preferred one is now described. Due to the positioning of the cutting knife, the resistance of the substance of the log tends to drive it back out of cutting action. Assume that a log, 9, Fig. 3, is making its initial revolution in the conditioning operation, a shaving S is being cut, indicated by the arrow 50; that it carries on its perimeter a knot 51, which is assumed to be beyond the capacity of the blade 10, to remove by passing through the base of the knot; but, the cutterhead is formed with a bumper 52, which is an integral part of or made rigid with the cutterhead 13, and contact of the knot 51 with the bumper 52 will cause the cutterhead 13 to be forced back until the depth of cut, indicated at 53, Fig. 4, will be maintained. It will be presumed that the amount of air pressure carried and available to operate the cylinders 26 and 27, will be less than that which would overload the cutterhead 13 even if the knot were near the center of the log and it was necessary to force

back both pistons to reduce the depth of cut to what the machine would safely stand.

Obviously also, the operator stationed at the controls 38 and 39, can not only swing the cutterhead 13 to accommodate the same to the taper of the log, but can also, to a considerable extent, control the load on the cutterhead and so manipulate the machine that the least amount of external log surface is removed that is required to condition the log.

The cutterhead is shown in what is believed to be its optimum position with respect to the log to be conditioned; that is, at the horizontal centerline of the log, so that the reaction or thrust of the log against the cutter blade is as near straight as possible. Obviously, the action can be realized to some extent as the cutterhead is raised towards the top of the log. In the claims, the optimum position where named will not be intended to exclude any other position where a beneficial result of the semi-floating cutterhead can be realized.

For logs of a given class, the maximum depth of cut may be relatively fixed and is of course the distance between the point of the blade 10 and the lower side of the roller 55; but that depth is instantly lessened if a protuberance pushes the cutterhead 13 away by contacting the bumper 52 as explained, and several revolutions of the log may be necessary to dispose of the protuberance. This is under control of the operator by the valves 38 and 39, and operation of the lead screws 14 and 15. When reducing a knot by successive cuts, he backs off the lead screws so that the log body is not reduced while successive cuts are removed from the knot.

Having fully explained the advantages of my semi-floating cutterhead for a lathe type log conditioner, the manner of its construction and its mode of operation, what I claim as new and desire to secure by Letters Patent, is:

1. A log conditioner of the lathe type wherein a log is held between head and tail stocks and revolved against a cutting implement comprising a frame, revolving head and tailstocks operably mounted thereon, a cutterhead movably towards and away from a log held between said head and tailstocks, leadscrews operably mounted on said frame, lead blocks threadably engaged by said leadscrews, means for revolving said leadscrews, yokes made rigid with said lead blocks and overhanging the rear sides of said cutterhead at the ends thereof, air cylinders with piston rods therein pivotally connected between said overhang of the yokes and said cutterhead, fluid pressure conduits connected independently to said air cylinders and independent manual control throttles for said conduits.

2. A log conditioning machine of the lathe type wherein a log is revolved against a cutter implement, having in combination therewith a semi-floating cutter head, lead screw operated means for bringing said cutter head into operative contact with a log, characterized by a plurality of air cylinders positioned between said lead screw operated means and said cutterhead whereby the attack of the cutterhead against the log is determined by the amount of pressure that the air cylinders deliver to the cutterhead in excess of the reaction force that the revolving log delivers against the cutterhead.

3. A cutterhead for a lathe type of log conditioner wherein a log is to be conditioned by revolving against a relatively stationary blade, comprising a cutter head, a cutting blade carried thereby, a semi-floating mounting for said cutter-

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head that permits unequal advance or retraction of the cutterhead within desirable limits, lead screw means for advancing the cutterhead to condition a log by removing parts of its surface and air cylinder means positioned between said lead-screw means and said cutterhead, operably connected thereto with control means therefor, to effectively cushion the attack of the cutting blade against the log proportionately to the air pressure that is within said air cylinders.

4. The combination as claimed in claim 3 and including a bumper made rigid with the said cutterhead and positioned in advance of the blade to contact a protuberance before it reaches the blade, said bumper effective upon contact with such protuberance on the log to drive the cutterhead back to reduce the amount of a forthcoming cut on said protuberance.

5. A log conditioning machine comprising a base, a frame mounted on said base, revoluble headstock and tailstock means revolubly mounted on said frame, a pair of leadscrews mounted on and supported on the frame normal to the axis of the head and tail stocks, an elongated semi-floating cutterhead indirectly responsively operable by said leadscrews to attack or withdraw from the log, air cylinders directly connected to said cutterhead in cushioning relationship between said leadscrews and cutterhead and independent manually operable control means for said air cylinders.

6. A machine for conditioning log surfaces prior to cutting them into veneer for veneer manufacture, comprising a base, a frame mounted thereon, opposed coaxial head and tail stocks revolubly mounted on said frame, an elongated semi-floating cutterhead spaced from and substantially in parallelism with said frame, leadscrews and leadscrew operated means mounted on said frame in normal relationship to the axis of the head and tail stocks, to attack a log revolved thereby, and an air cylinder interpositioned between each end of the cutterhead and its operating leadscrew to cushion the same and effective upon selective control thereof to vary the alignment of the cutterhead with respect to the axis of a revolving log.

7. The combination as claimed in claim 6 and including a bumper plate on said cutterhead positioned in advance of the cutter part of the cutterhead which, upon being contacted by a protuberance on a revolving log, tends to throw the cutterhead out of cutting engagement with the log save for a cut of fixed amount on the protuberance.

8. A lathe type barker and conditioner for logs

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having in combination therewith an elongated semi-floating cutterhead comprising a carriage portion, a cutter portion mounted on said carriage portion, a pair of spaced apart air cylinders comprising yielding means between said carriage and cutter portions, and a bumper made rigid with said cutter portion, positioned to precede the cutting part of said cutter portion to be contacted by a knot or the like, if any, thus to force the cutter portion backwards against said air cylinders to limit the cut of said cutter portion into such a hazardous knot, or the like.

9. A log conditioning machine comprising a base, a frame mounted on said base, a revoluble headstock, tailstock means revolubly mounted on said frame, a pair of leadscrews mounted on and supported on the frame normal to the axis of the head and tail stocks, an elongated semifloating cutterhead responsively operable by said leadscrews to attack or withdraw from the log with air cylinder backing means directly connected to said cutterhead in cushioning relationship between said lead screws and cutterhead and independent manually operable control means for said air cylinder backing means.

10. A log conditioning machine comprising a log lathe, a cutterhead therefor, means for advancing and withdrawing said cutterhead, a blade holder floatingly mounted on said cutterhead, a blade mounted thereon, air cylinders at each end of said blade holder positioned between said blade holder and said advancing means to resiliently hold said blade in contact with a log in said lathe and a bumper mounted on said blade holder positioned to contact a protuberance on a log before it contacts said blade, to overcome said air cylinders and limit the depth of cut of said blade into such protuberance.

11. The combination as claimed in claim 10, wherein the air cylinders have separate air supply control means for independent regulation.

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