April 7, 1953 W. O. FORMAN 2,634,062

WOOD AND BRUSH CHIPPING MACHINE

Filed Sept. 21, 1948 2 SHEETS—SHEET 1

Fig. 1

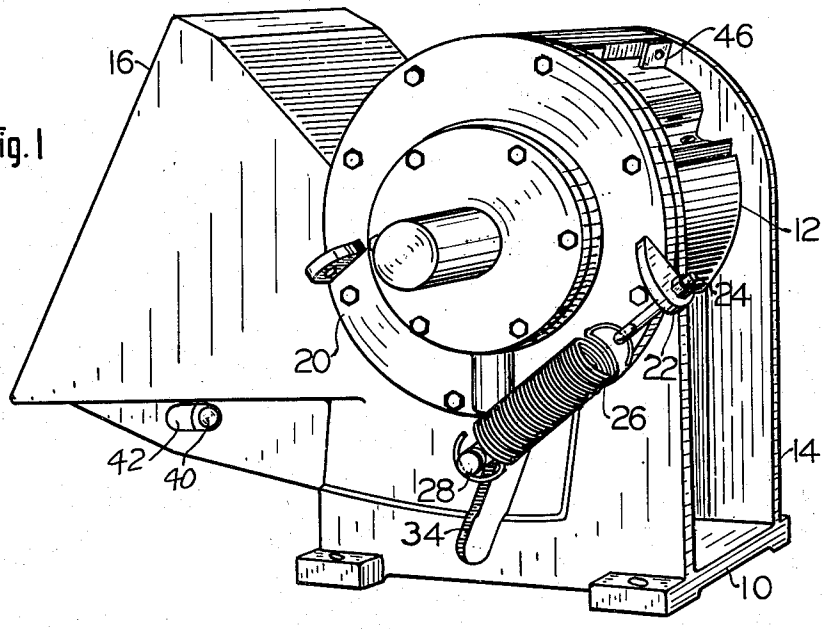


Fig. 4

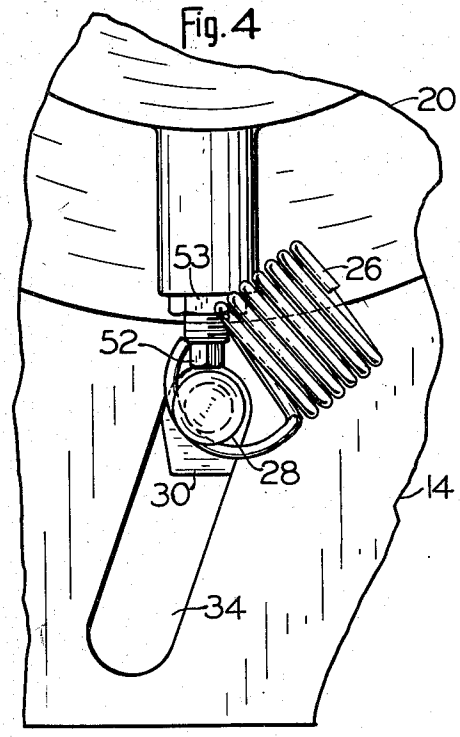
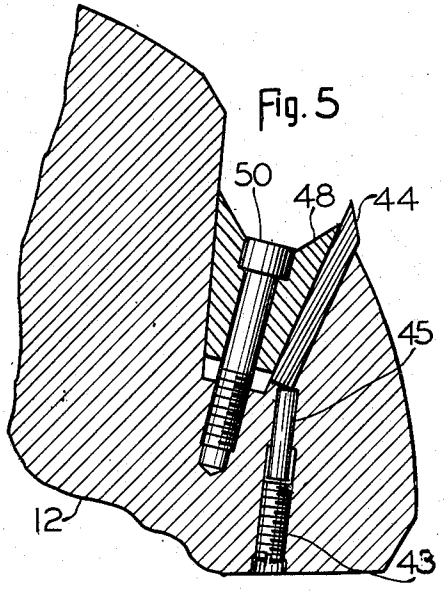


Fig. 5



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WOOD AND BRUSH CHIPPING MACHINE

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Fig. 3

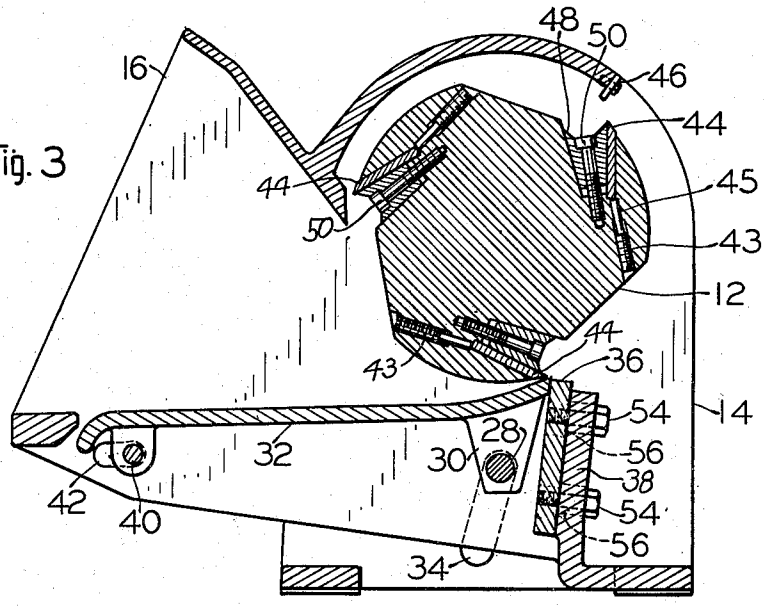
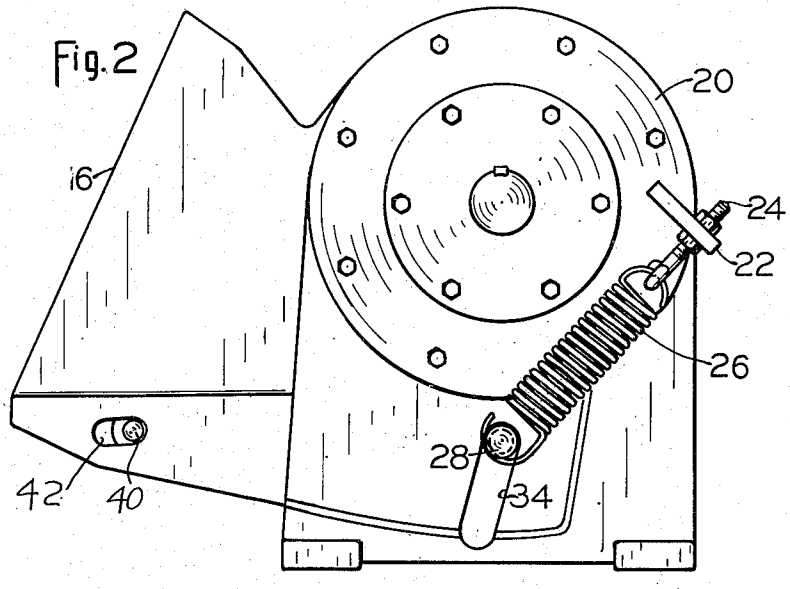


Fig. 2



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WOOD AND BRUSH CHIPPING MACHINE

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9 Claims. (Cl. 241—239)

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This invention relates to wood and brush chipping machines and the primary object of the invention resides in the provision of a relatively easily portable and operative machine for reducing brush branches, wood and small logs as, for instance, up to 5'' in diameter, to relatively small chips for the purpose of destroying the brush and dispensing with it and also to render the same in condition for easier transportation so that it may be removed from the scene of activity of deforestation or timber felling.

Brush branches and small trees left in the wake of lumbering operations always constitute a fire hazard besides rendering the scene of operations exceedingly unkempt in appearance. Heretofore, the only way to remove the brush and branches has been to burn them or pile them up in trucks and remove them. Burning is a relatively hazardous way in which to get rid of the brush and removing the branches in trucks is very expensive and difficult to accomplish because the brush takes up a large volume of space in comparison with its weight and is hard to handle.

This invention, however, provides a machine for chipping the branches and brush in relatively small chips of up to 4'' or 5'', in length, which chips are easily handled and transported and which in many cases are used on the scene of lumbering operations for filling in swamps in road building. These chips are also much less inflammable than rough cut branches and brush because they tend to pack down and stay damp whereas brush does not pack down and quickly dries out.

Another object of the invention resides in the provision of a relatively high speed cylindrical cutting tool which is adapted to be driven at high speed by a prime mover in combination with a spring loaded work supporting platform which constantly tends to resiliently force the branches and brush into the cutter, said platform being located at the infeed side of the cutter so that the detritus is thrown outwardly away therefrom after being formed; and the provision of a device as above stated in which the platform is movable with relation to the cutter head at its end closest thereto and is supported on relatively strong springs which constantly tend to urge the platform and, therefore, the work into the cutter head.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which

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Fig. 1 is a perspective view illustrating the machine;

Fig. 2 is an enlarged end elevation thereof;

Fig. 3 is a sectional vertical view through the machine;

Fig. 4 is an enlarged detail showing a stop for the work platform; and

Fig. 5 is a sectional view through the cutter head showing the manner of fastening the cutter thereto.

As shown in Fig. 1 the device is supported on a framework 10 which will be carried on wheels or a skid, etc., and which also may carry a prime mover such as an internal combustion engine.

The chipping device is shown as mounted on the framework in a position so that the cylindrical cutter generally indicated at 12 may be directly driven by the shaft of the engine and is mounted in bearings between a pair of heavy plates 14 on the frame 10. The cutter head is relatively heavy and is adapted to be rotated at high speed and for that reason has a high inertia which is particularly suitable to this device. The plates 14 are made heavy and in turn may mount heavy bearings for supporting the cutter head.

At the input side of the cutter head there is located a feed hopper or the like 16 which as illustrated, is substantially horizontal and has been specially made in the present case for ease in receiving long heavy branches and the trunks of small trees up to say 5'' in diameter, which may be handled by a man standing behind the machine and easily thrust into the hopper for the chipping operation. The location, angle and form of this hopper is not to be taken as a limitation on the present invention because, as shown, these attributes are those most convenient for the particular purpose. At the delivery side of the machine there may be disposed a cover plate (not shown) mounted on hinges, this cover plate normally closing the cutter head except while it is actually operating.

As seen in Fig. 2, the device is provided with end plates 20 closing the cutter head bearing openings in the plates 14 and protecting the bearings for the cylindrical cutter 12. On each closure plate 20 there is a boss 22 provided with a screw threaded adjustable bolt 24 to one end of which is detachably secured a spring 26. At its other end the spring 26 is connected to a rod 28 in turn secured to a lug 30 on a movable feed plate 32. The rod 28 extends through a slot 34 in the end plate 14 to receive the spring.

The forward end of the plate 32 moves rela-

tively to a bed knife 36 which is adjustably mounted on a plate 38 arranged at a slight angle to the vertical, as clearly shown in Fig. 3. The spring 26 is arranged at such an angle as to constantly hold feed plate 32 against the bed knife 36. The feed plate may rise and fall as provided for by the spring but only in the direction allowed by the plate 38, which is arranged substantially tangentially to the periphery of the cutter head 12.

At its end remote from the cutter the feed plate 32 is provided with a slidable and rotatable rod 40 located in a slot 42 in one of the plates 14 and this supports the rear end of the platform for movement in a substantially but not quite horizontal direction, while at the same time permitting the other end of the plate to move relative to the cutter.

It will be seen that the feed plate 32 "floats" and in general approaches and is retracted from the cutter head. In any case, however, the feed plate 32 tends to feed work such as branches, logs, etc., into the cutter head. Where a relatively large diameter log is thrust into the hopper 16 it will tend to depress the end of the feed plate nearest the cutter against the action of the springs 26 and by so doing will allow the cutter blades 44 carried by cutter head 12 to operate on the work at the top side thereof and feed the work by means of the cutter digging thereinto. At any momentary release of pressure or easing of pressure on the feed plate 32, the springs 26 bring the same up closer to the cutter head 12 so that the work is always thrust to the cutter in a direction to cause the same to feed in the work, chip the work and, at the same time, to throw the cut chips as, for instance, to the right in Figs. 2 and 3. As will be apparent from Fig. 3 the mouth of the feed plate 32 forms the bottom of the feed hopper 16. Thus, the throat portion of the hopper adjacent the cylindrical cutter head is variable in size owing to the movable mounting of the feed plate 32, but such throat portion is at all times large enough so that as one cutter blade 44 carried by the cutter head 12 leaves the throat portion in passing beyond the stationary blade 36 another cutter blade is ready to engage the branch or the like being fed into the machine, thus providing a self-feeding operation independent of gravity while at the same time chipping or comminuting the material being fed to the machine. It will be further apparent that as the end of the feed plate adjacent the cutter head is depressed or moved away from the cutter head the throat portion will be enlarged, thus permitting entry of a larger branch than would otherwise be possible and insuring the simultaneous feeding and cutting operation above described. It will also be apparent that this simultaneous feeding and chipping or cutting operation would occur even if the stationary parts of the hopper were omitted and only the feeding plate 32 retained.

By this means 5'' diameter logs are reduced to chips and shavings in a matter of seconds and enormous quantities of branches and brush may be reduced to easily handled and transported chips in a very short period of time. The feed plate 32 actually feeds the work to the cutter head regardless of the size of the work up to, for instance, a 5'' diameter log, depending upon the size of the machine made. In actual practice, it is only necessary to thrust the log or branch against the cutter head through the hopper, and the cutter head then grips the log and passes it through the machine, so that the operator does not have to force it through the machine, but merely has to start it. Due to this attribute the machine performs an enormous quantity of work because the operator may start a new log before the old log is through, and it takes three or four men to feed work to the machine at its capacity.

The cutters 44 may be adjusted by the screws shown at 43 acting on rolls 45 to a guide 46 so that the even working extent of the cutter will always be maintained, and wedges 48 are held by bolts 50 to lock the blades in place.

Set screws 52, one at each end of the cutter, are to limit the travel of the feed plate and by means of jam nuts 53 the feed plate may be set so that its edge has about a sixty-fourth inch clearance.

The bed knife can be adjusted by bolts 54 in slots 56 as desired, to and from the cutter.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed otherwise than as set forth in the claims, but what I claim is:

1. A self feeding wood and brush chipping machine comprising a frame, material comminuting means including a cylindrical cutter head rotatably mounted on an axis on said frame and a stationary blade extending toward and coacting with the rotatable cutter head, peripherally spaced longitudinal knives on the cutter head, work feeding and supporting means coacting with said comminuting means for automatically feeding therethrough material of varying size independent of gravity, said feeding and supporting means comprising a table pivoted on an axis parallel to the cutter head axis and arranged in generally tangential relation to the cutter head, the free end of said table lying adjacent said cutter head and said stationary cutting blade, supporting means for the free end of the table providing yielding movement of said table end toward and away from the rotatable cutter head, means urging the table toward the cutter head while its end is maintained in sliding relation against the stationary blade, and means limiting the movement of said free end toward the cutter head.

2. A self feeding wood and brush chipping machine comprising a frame, material comminuting means including a cylindrical cutter head rotatably mounted on said frame and a stationary blade extending toward and coacting with the rotatable cutter head, said cutter head having a plurality of peripherally spaced longitudinal cutting knives, work feeding and supporting means coacting with said comminuting means for automatically feeding therethrough material of varying size independent of gravity, said feeding and supporting means comprising a pivoted table arranged in generally tangential relation to the cutter head and with the free end thereof adjacent said stationary blade, said table being pivoted on an axis parallel to the cutter head axis, supporting means for the free end of the table permitting yielding movement of said table end toward and away from the rotatable cutter head, means urging the table toward the cutter head while its end is maintained against the stationary blade, and means limiting the movement of said table free end toward the cutter head.

3. A machine as set forth in claim 2 wherein the pivoted end of the feed table is slidably mounted.

4. A machine as set forth in claim 2 wherein both ends of the table are slidably mounted.

5. A machine as set forth in claim 2 wherein the free end of the pivoted feed table is slidably

arranged in relative contacting relation to the stationary blade.

6. A self feeding wood and brush chipping machine comprising a frame, material comminuting means including a cylindrical cutter head rotatably mounted on a horizontal axis on said frame and a stationary vertical blade adjacent the lower surface of the rotatable cutter head, said cutter head having a plurality of peripherally spaced longitudinal cutting knives, work feeding and supporting means coacting with said comminuting means for automatically feeding therethrough material of varying size independent of gravity, said feeding and supporting means comprising a table pivoted on a horizontal axis and arranged in generally tangential horizontal relation to the cutter head and with the free end thereof adjacent said stationary cutting knife, supporting means for the free end of the table permitting yielding movement of said table end toward and away from the rotatable cutter head while its end is maintained against the stationary knife, and means limiting the movement of said free end toward the cutter head.

7. A machine as set forth in claim 6 wherein the pivoted end of the feed plate is slidably mounted.

8. A machine as set forth in claim 6 wherein both ends of the table are slidably mounted.

9. A self-feeding wood and brush chipping machine comprising a frame, material comminuting means including a cylindrical cutter head rotatably mounted on an axis on said frame and a stationary blade extending toward and coacting with the rotatable cutter head, peripherally spaced longitudinal knives on the cutter head, work feeding and supporting means coacting with said comminuting means for automatically feeding therethrough material of varying size independent of gravity, said feeding and supporting means comprising a table arranged in generally tangential relation to the cutter head, one end of said table lying adjacent said cutter head and said stationary cutting blade, supporting means for the said one end of the table providing yielding movement of said table end toward and away from the rotatable cutter head, means urging the table toward the cutter head while its said one end is maintained in sliding relation against the stationary blade, and means limiting the movement of said one table end toward the cutter head.

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