Jan. 24, 1939. A. HAUGE 2,145,177

FLOCK CUTTING MACHINE

Filed Oct. 21, 1935 4 Sheets-Sheet 1

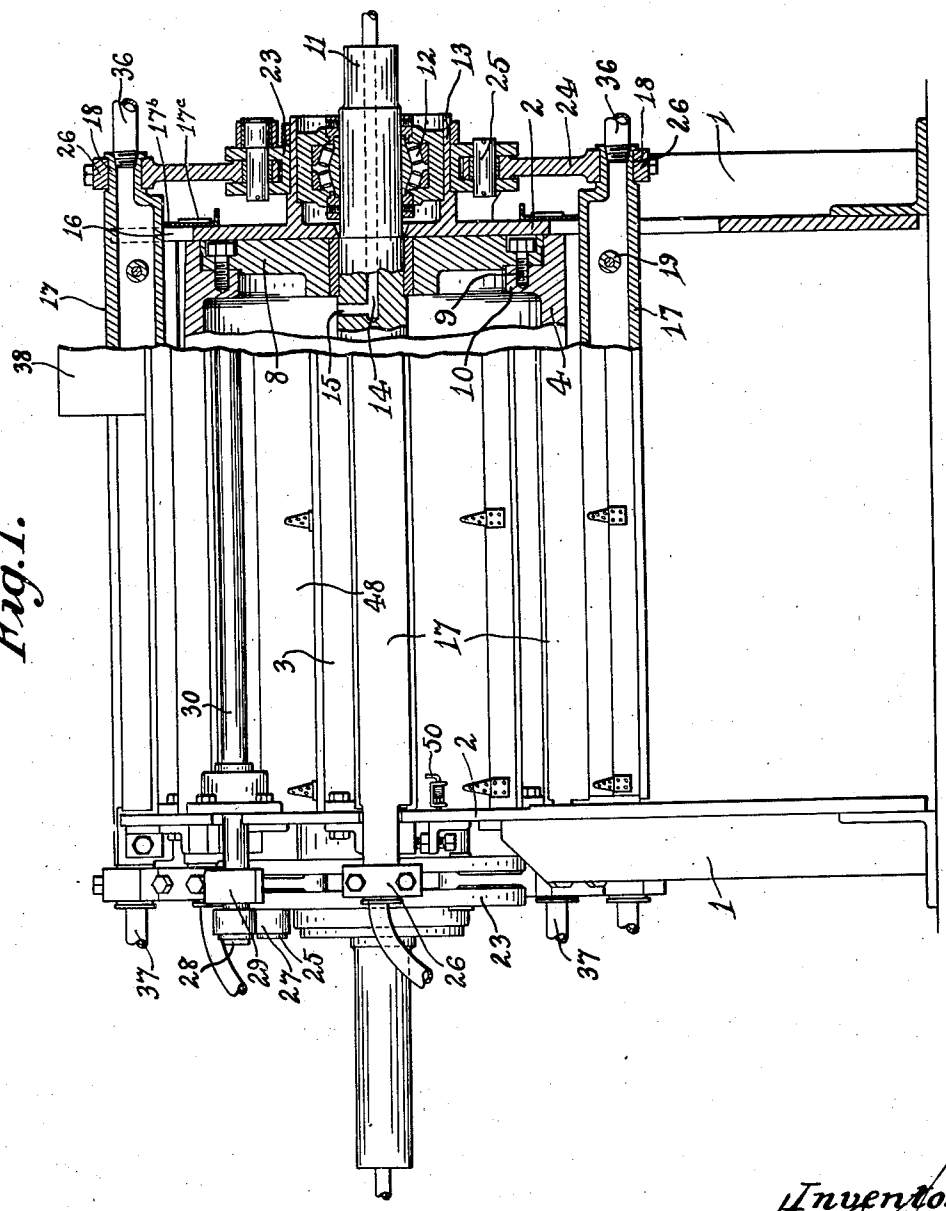


Fig. 1.

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Fig.2.

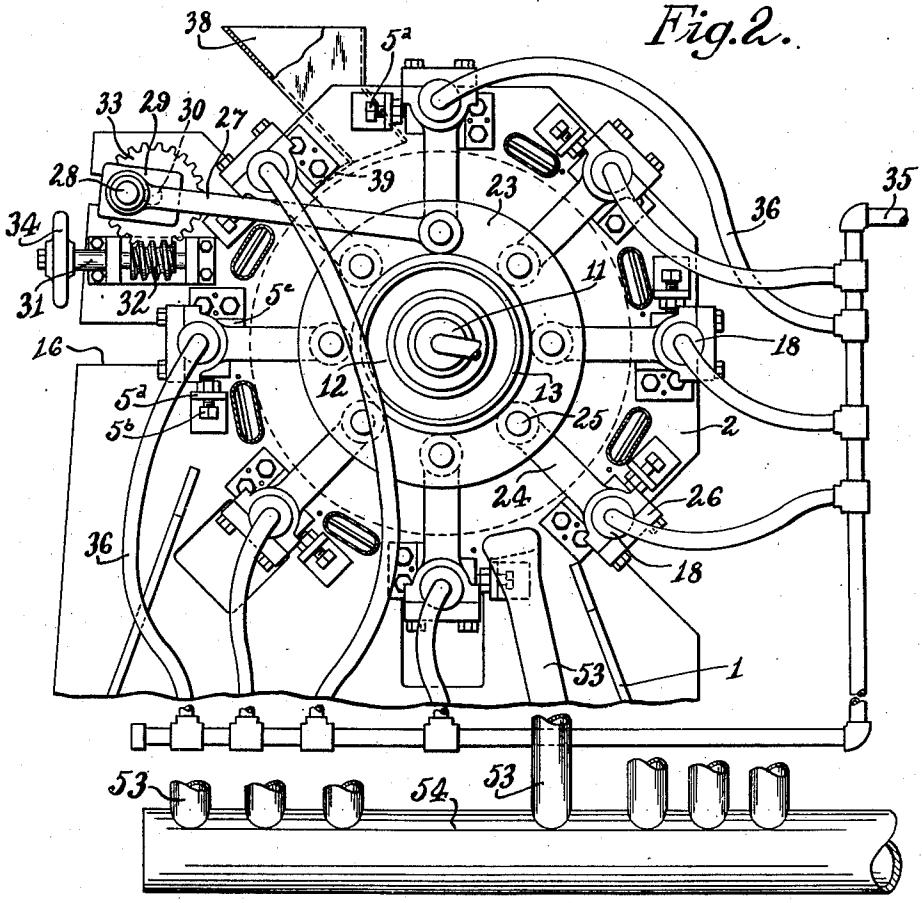
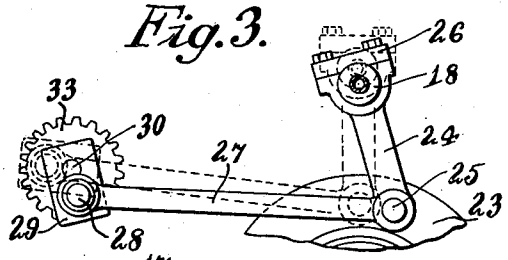


Fig.3.



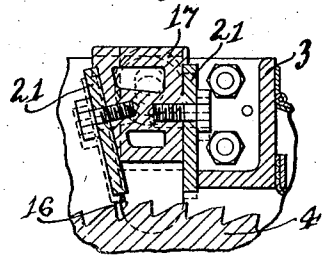


Fig.4.

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Fig. 5.

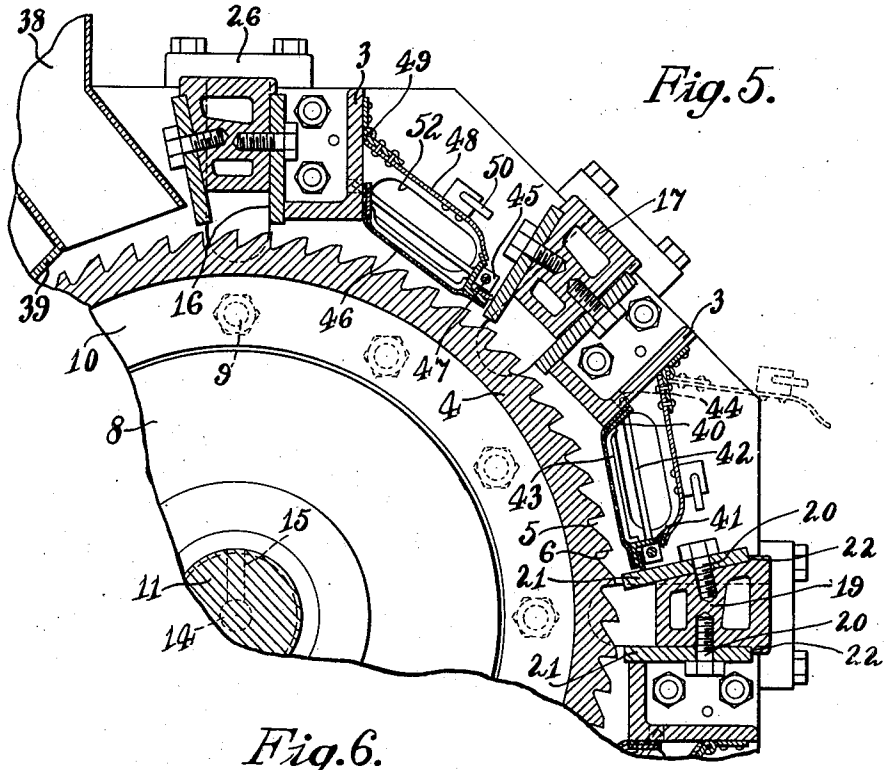


Fig. 6.

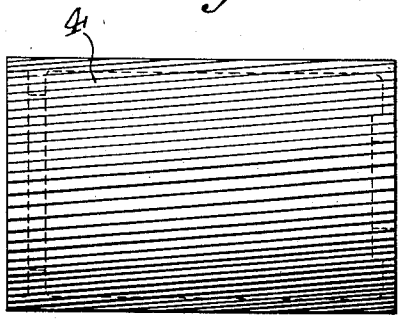


Fig. 7.

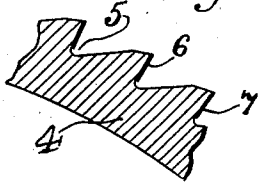
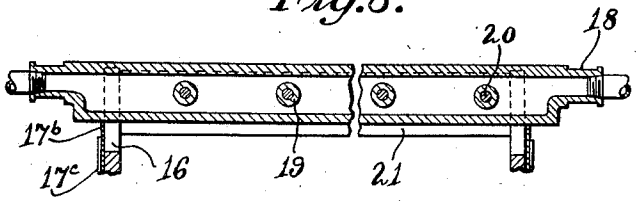


Fig. 8.



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Fig.9.

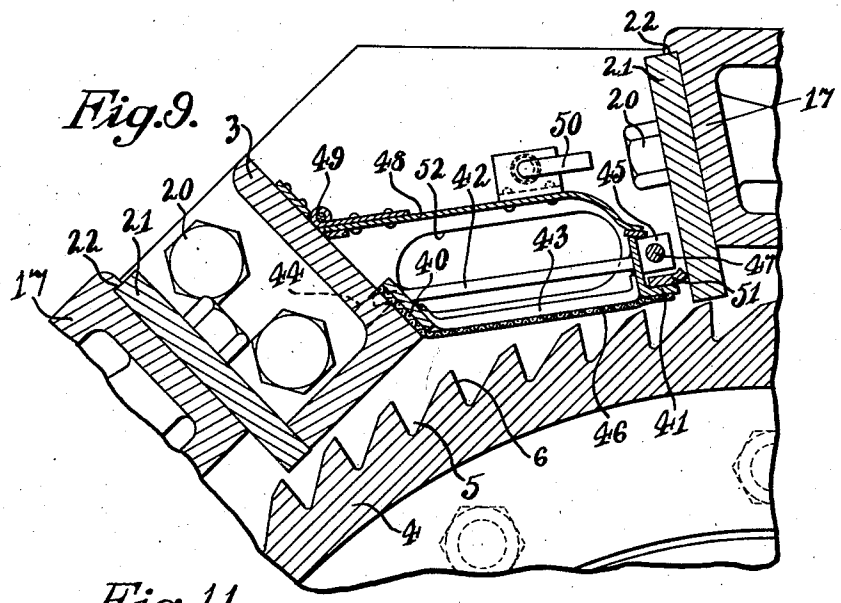


Fig.11.

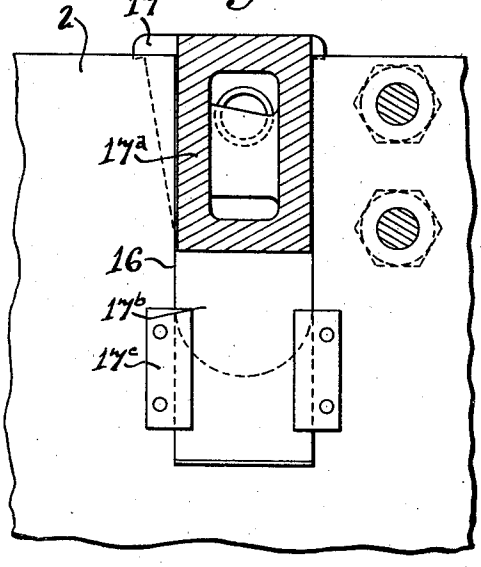
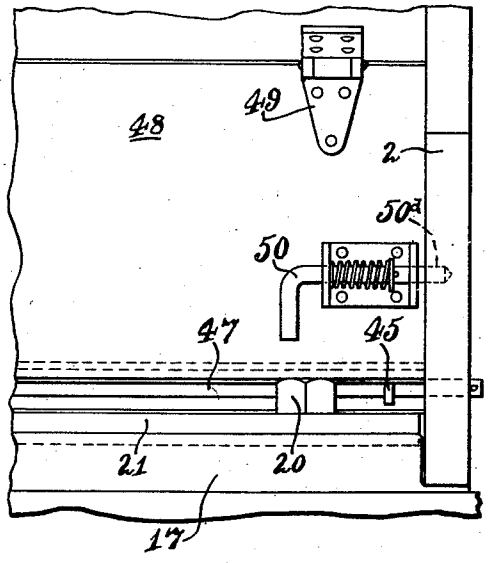


Fig.10.



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Patented Jan. 24, 1939 2,145,177

UNITED STATES PATENT OFFICE

2,145,177

FLOCK CUTTING MACHINE

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Application October 21, 1935, Serial No. 45,989

42 Claims. (Cl. 83—6)

My invention relates to flock cutting machines.

The present invention has among its objects the improvement of the construction and operation of such machine whereby, while producing an improved machine of increased capacity and also substantially reducing both power and labor costs, it is made possible to obtain an improved product having less so-called "threads" or "flakes" therein and at the same time to minimize the danger from fire. Another object of the invention is to provide for improved means for adjusting the stationary knives toward and from the rotary cutter whereby these knives may all be simultaneously and equally adjusted at both ends thereof. Further objects of the invention are the provision of improved means for supporting the knives upon hollow water-cooled lags, which lags are adjustably mounted upon the frame of the machine, the provision of an improved frame structure wherein these lags are disposed around the rotary cutter in an improved arrangement, and the provision of such improved lags with improved screens and covers for the latter in such manner as to form an improved enclosing casing structure. Other objects of the invention provide for an improved construction of the rotary cutter, and also for improved means for cooling this cutter. Still further objects of the invention are the provision of improved means for withdrawing the finely cut material through said screens and from the ends of the rotary cutter, so that the machine will be burdened only with the coarse material needing further cutting action, and also to provide improved means for collecting and transporting from the machine the finely cut material whereby it may be handled expeditiously and efficiently. Other objects of the invention include the provision of an improved construction of the machine in general, whereby it will be efficient in operation and may be manufactured at a relatively small cost. These and other objects and advantages of my improved construction will, however, hereinafter more fully appear.

In the accompanying drawings, I have shown for purposes of illustration, one embodiment which my invention may assume in practice.

In these drawings—

Figure 1 is a front elevational view of my improved flock cutting machine, shown partly in section;

Fig. 2 is an end elevational view of the same;

Fig. 3 is an elevational view of part of the mechanism for adjusting the stationary knives;

Fig. 4 is a fragmentary sectional view showing the knife-supporting means;

Fig. 5 is a partial sectional view of the machine;

Fig. 6 is an elevational view of the rotary cutter;

Fig. 7 is a fragmentary sectional view showing the cutting edges of the rotary cutter;

Fig. 8 is a longitudinal sectional view of one of the knife-supporting lags;

Fig. 9 is an enlarged sectional view showing the collecting chambers and associated parts;

Fig. 10 is a fragmentary plan view of a collecting chamber cover, and

Fig. 11 is a sectional view of one of the lag members taken adjacent one of the end frames.

Referring to the illustrated form of my invention shown in the drawings, the machine comprises a pair of standards 1 upon each of which an end frame 2 is supported, which end frames carry the working parts of the machine. Spacing bars 3 in the form of angle plates extend from one end frame to the other and are secured at their ends to the end frames or plates.

The rotary cutter comprises a cylinder 4 having slots 5 milled therein to provide cutting edges 6. As shown in Fig. 6, these slots may be cut helically across the cylinder so that the cutting edges are slightly inclined with respect to the cylinder axis. It will be preferred to coat the cutting edges with a hard metal such as Stellite, which is an alloy containing cobalt and chromium, as shown at 7. This will prevent undue wear upon the cutting edges, and if they become worn they may be readily sharpened. Also when the cutting edges are so worn as to require it, the construction is such as to permit removal of the cylinder or shell 4 and substitution of a new cylinder.

The cylinder is closed at its ends by cylinder heads 8, which may be secured by bolts 9 to inwardly projecting flanges 10 upon the cylinder. The cylinder heads are provided with openings in which is secured the shaft 11, which is of sufficient length so that its ends project from the cylinder heads and are mounted by means of roller bearings 12 in bearing housings 13 provided upon the outside of the end frames 2. It will, of course, be understood that the end frames are also provided with openings registering with the openings in the cylinder head through which the shaft 11 extends. The cylinder is hollow, as shown in Figs. 1 and 5, and provision is made for passing a cooling fluid through the cylinder by means of water passages 14 extending axially through the ends of the shaft 11 and branch radial passages 15 connecting the passages 14 with the hollow interior of the cylinder. It will be understood

that suitable connections from the passages 14 to water inlet and outlet pipes are provided.

A number of stationary knives are provided about the periphery of the rotary cutter to cooperate therewith. As illustrated, these knives are mounted upon hollow knife-supporting lag members, which are in turn supported in the end frames 2, as will be described more specifically hereinafter. These lag members are spaced about the cylinder, and their number may, of course, be varied as desired. In the illustrated form of my invention, I have shown eight of such lag members, each of which supports two stationary knives.

In order to properly support the knife-supporting lags and to arrange for their adjustment with the knives thereon toward and from the rotary cutter, each end frame is provided with a number of slots 16 within which are slidably mounted the ends of the hollow lag members 17. These slots extend substantially radially of the cutter so that the knives may be moved toward and from the axis of this cutter. The lag members, it will be understood, extend across the machine from one end frame to the other, and are provided with extended ends 18 projecting beyond the end frames and are of round cross-section, for a purpose to be hereinafter described. The lag members, as described, are hollow and may be provided with spacing studs 19 extending from one wall to the other to receive the bolts or screws 20 which secure the knives 21 to the side faces of the lags. The bases of the knives may rest against shoulders 22 formed upon the walls of the lag members. It will be noted, as shown more especially in Figs. 4 and 5, that in cross-sectional form the lags are not precisely rectangular, the forward face of the lag (with respect to the direction of rotation of the cutter) sloping toward the rear face, and it will also be noted that there is a knife supported upon each side face of each of the lags so that, as illustrated, the number of knives is double that of the lags. The sloping face of the lag thus provides clearance between the rear edge of the knife thereon and the cutter. As shown at 17^a (Fig. 11) the parts of the lag members disposed in slots 16 are of rectangular shape to conform to the side walls of the slots. These slots may be covered below the lags by plates or slides 17^b slidably mounted on the end frames 2 in guides 17^c.

I have provided means for insuring equal and simultaneous adjustment of the stationary knives toward and from the rotary cutters, the adjustment being accomplished by movement of the lags within the slots 16 in the end frames. Proper adjustment of these knives is necessary to the efficient and close working of the machine, and it is of great advantage from the standpoint of efficiency to provide means for the equal and simultaneous adjustment of all of the stationary knives. For this purpose, a ring 23 is rotatably mounted upon each of the bearing housings 13, and crank arms 24 are pivoted at their inner ends to these rings by means of pins 25. The outer ends of these crank arms pivotally embrace the outer rounded ends 18 of the lags 17, and are secured there to my means of plates 26 bolted to the bifurcated ends of the crank arms. One of the pins 25 at each side of the machine is extended, and upon each of such pins is pivoted a link 27 pivoted at its other end upon a crank pin 28 on a crank 29, which cranks are secured to the ends of a shaft 30. It will be understood that the shaft 30 extends across the machine and is provided at the other end with a similar crank to effect adjustment of the ends of the lags at that side of the machine.

Upon one of the end frames a shaft 31 is rotatably mounted and carries a worm 32, the teeth of which are in mesh with a worm wheel 33 secured to the shaft 30, the shaft 31 being manipulated by a hand wheel 34. It will be clear from the foregoing that as the hand wheel 34 is rotated, the shaft 30 will also be turned, carrying with it the cranks 29 at each side of the machine. Movement of the cranks will effect movement of the links 27, as shown in Fig. 3, which will rotate the rings 23 and move the inner ends of the crank arms 24. This will move the outer ends of these crank arms toward and from the shaft of the rotary cutter and thereby move the knife-supporting lags inwardly or outwardly within the slots 16 in the end frames. It will be apparent that the knife-supporting lags with the knives thereon will under this arrangement be simultaneously adjusted toward or from the rotary cutters, and also equal adjustment of all the knives will result. Adjacent one side of each of the slots 16 on the end plates is provided a flanged lug 5^a carrying a set screw 5^b, and at the other side of the slot is provided a flanged lug 5^c. When the lag member has been adjusted to proper position, it is securely fixed in this position by turning up the set screw 5^b, which clamps the end of the lag against the flanged lug 5^c on the opposite side of the slot, so that the lags and knives supported thereon will be firmly held in adjusted position.

As shown more especially in Fig. 2, provision is made for passing a cooling fluid through the hollow lags from a main water inlet pipe 35, to which are connected flexible branch conduits 36, one of which enters the end portion of each of the lag members. At its other end each lag is provided with a flexible water outlet conduit 37 which is connected to a water outlet pipe (not shown). It will be apparent that both the rotary and stationary cutters will thus be provided with efficient cooling means, and that not only the stationary cutters but also the lags upon which they are supported will be effectively cooled.

As shown more especially in Fig. 1, a hopper 38 is provided between two adjacent lag members, through which hopper the raw material is fed to the machine. The lower end of this hopper is arranged adjacent one of the stationary knives at one side, and at the other side the space between the lower portion of the hopper and the adjacent bar 3 may be closed by a plate 39.

I have also provided novel and efficient means for withdrawing the finely cut material from the cutter and transporting this material to any desired place for collection. As will be hereinafter described, this withdrawing and transporting means is provided in the space between the adjacent lag members and serves to close this space and therefore provide a closed chamber around the rotary cutter. As illustrated, these withdrawing or separating means and the knife-supporting lags are arranged alternately about the cutter except at the point where the hopper is positioned.

The withdrawing and transporting means will now be described. It will be noted that the spacing bars 3, as shown more especially in Fig. 5, are L-shaped in cross-section, or angle bars, and that the flanges upon the lower portions

thereof contact with the adjacent stationary knives. A screen frame is interposed in the space between the radial side of these bars and the next adjacent knife. These screen frames comprise a plate 40 which extends across the machine from one frame to the other, and at the other side a co-extensive angle member 41, the plate and angle member being held together by rods 42 at their central portions and end spacing members 43. Each of these rods projects exteriorly from the plate 40, and its projecting end is received in an opening 44 in the adjacent spacing bar 3. Adjacent each end of the angle member 41 is provided a perforated lug or block 45. Screens 46 are secured at one side to the plate 40 and at the other side to the angle member 41. These screen frames and screens thereon may be put into place by first inserting the end of the rod 42 in the opening 44 and then swinging the frame into its proper position, as shown in Fig. 5. At that time the openings in the perforated blocks 45 will register with openings in the end frames, and rods 47 may be passed through the end frames and through the blocks 45 to secure the screen frames in position. It will be understood that these rods will pass from one end frame to the other and secure the screen frames in position at both ends.

In order to form a collecting chamber for the fine material back of each of the screens 46, a sheet metal cover 48 is hinged at 49 to the spacer bar 3, and this cover is provided at each end with a spring-pressed latch 50, which enters an opening 50a in the end frame 2 to hold the cover plate in position. The open and closed position of these cover plates is shown in dotted and full lines respectively in Fig. 5. A sealing member 51 may be secured to each angle member 41 to seal the space between this member and the adjacent stationary knife. It will be apparent, therefore, that the cover plates 48 effectively close the space about the rotary cutter, or that a closed chamber for the cutting of the flock material is provided.

To transport the material from the space between the screens 46 and the cover plates 48, the end frames 2 are provided with openings 52 leading into these spaces. To the openings upon one of the end plates are connected branch pipes 53 leading to a main pipe 54 connected to the intake of a suction fan or blower, which draws the finely cut material passing through the screens from the space between the screens and the cover plates and transports it to the collecting room, or any desired place. At the other side of the machine the openings 52 in the end plates serve to permit the admission of air to the space behind the screens to assist in the transporting of the flock. If desired, suitable adjustable covers (not shown) may be provided for these openings to restrict the admission of air thereto, so as to permit a part of the air necessary to transport the material to be drawn through the screens.

In the operation of the machine raw material is fed to the cutting chamber through the hopper 38. This material is carried around by the rotary cutter, and in cooperation with the stationary knives 21 is cut as the cutter rotates. In the process the material which is cut sufficiently finely to pass through the screens 46 is drawn therethrough by the air blast into the space between these screens and the covers 48, and is withdrawn from these spaces by the air blast through the branch pipes 53 and main pipes 54. The coarser material will be carried around the machine by the rotor to be re-cut until it is sufficiently fine to be passed through the screens. It will be seen that the fineness of the product may be regulated by the fineness of the mesh of the screens employed.

If it is desired to adjust the stationary cutters with respect to the rotary cutter, this is done by turning the hand wheel 34, which, through the mechanism hereinbefore described, moves the link 27 and rotates the ring 23, thus swinging the crank arms 24, as shown in dotted and full line positions in Fig. 3. This serves to move the outer ends of the crank arms and thus moves the knife-supporting lags 17 within the slots 16 in the end frames 2. This obviously effects an adjustment of the stationary knives 21 which are secured to the lags, as shown in dotted and full line positions in Fig. 4.

It will also be seen that the collecting chambers between the screens 46 and the covers 48 alternate around the cutting chamber with the knife-supporting lags, and that these collecting chambers serve in conjunction with the spacer bars 3 and the knife-supporting lags to form a closed chamber about the rotary cutter.

As a result of my improved construction, it is made possible to get a markedly improved product as compared with that obtainable from prior patented constructions, in that the product is more uniform and free from so-called "threads" or "flakes", the short lengths being allowed to escape through the several screens without being again cut by the rotary cutter. Further, it is found that as compared with prior patented flock cutters, it is possible to reduce the power and labor costs substantially 50% while obtaining the above advantages and further producing a machine of markedly increased capacity. Attention is further directed to the marked facility with which the knives may be adjusted, and to the fact that the same may be adjusted in such manner as to make the same cut throughout their length and also effectively distribute the flock throughout the length of the cylinder. At the same time, it will be observed that through the provision of the improved cooling structure for the stationary knives and rotary cutter, it is possible to maintain the temperature of the machine and of the flock within safe limits over extended runs. These and other advantages of my improved construction will, however, be clearly apparent to those skilled in the art.

While I have in this application specifically described one form which my invention may assume in practice, it will be understood that this form is chosen for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. A flock cutting machine comprising a rotary cutter, a peripheral enclosing structure therefor including peripherally spaced adjustable longitudinally extending knives, and mechanism having common operating means and outside said enclosing structure and acting on the opposite ends of said knives for simultaneously adjusting different peripherally located knives toward or from said cutter.

2. A flock cutting machine comprising an elongated rotary cutter, an elongated stationary knife structure cooperating therewith including a plurality of adjustable knife supporting members and knives thereon, and means positively con-

nected to opposite ends of said members for simultaneously adjusting the opposite ends of said knives toward or from said cutter.

3. A flock cutting machine comprising an elongated rotary cutter, a stationary knife structure cooperating therewith comprising knife-supporting members and knives thereon spaced about the periphery of said cutter, and operatively connected means at opposite ends of said structure for effecting simultaneous adjustment of a plurality of different knives peripherally located relative to each other.

4. A flock cutting machine comprising a rotary cutter, a stationary knife structure cooperating therewith comprising knife-supporting members and knives thereon spaced about the periphery of said cutter, and spaced means at opposite ends of said cutter and having operative connections exposing said structure between said ends for effecting equal adjustment of a plurality of different peripherally located knives relative to each other.

5. A flock cutting machine comprising a rotary cutter, a stationary knife structure cooperating therewith comprising knife-supporting members and knives thereon, and means at opposite ends of each of a plurality of said members and at opposite ends of said cutter and having connections between said means smaller in diameter than said cutter for effecting simultaneous and equal adjustment of a plurality of said knives.

6. A flock cutting machine comprising an elongated rotary cutter, a plurality of elongated knife-supporting lag members having ends at opposite ends of said cutter arranged about the periphery of said cutter and having knives thereon to cooperate with the cutter, and operatively connected means acting on the ends of said lag members at the opposite ends of said cutter for effecting simultaneous adjustment of said lag members with the knives thereon.

7. A flock cutting machine comprising an elongated rotary cutter, a plurality of elongated knife-supporting lag members having ends at opposite ends of said cutter arranged about the periphery of said cutter and having knives thereon to cooperate with the cutter, and operatively connected means acting on the ends of said lag members at the opposite ends of said cutter for effecting equal adjustment of said lag members with the knives thereon.

8. A flock cutting machine comprising an elongated rotary cutter, a plurality of elongated knife-supporting lag members having ends at opposite ends of said cutter arranged about the periphery of said cutter and having knives thereon to cooperate with the cutter, and operatively connected means acting on the ends of said lag members at the opposite ends of said cutter for effecting simultaneous and equal adjustment of the lag members with the knives thereon.

9. A flock cutting machine comprising a rotary cutter and stationary knives arranged about the periphery thereof to cooperate therewith in the cutting operation, adjusting means connected to the opposite ends of a plurality of said knives to adjust them relative to each other toward and from the cutter, and operating means at one side of said cutter operatively connected to actuate said adjusting means.

10. A flock cutting machine comprising a rotary cutter, an enclosing casing fixed against rotation and including a plurality of stationary knives arranged about the cutter to cooperate therewith, and operatively connected means at opposite ends of said knives for effecting simultaneous adjustment of different knives relative to each other and acting on both ends of said knives.

11. A flock cutting machine comprising a rotary cutter, an enclosing casing including screens and a plurality of stationary knives arranged about the cutter to cooperate therewith, and operatively connected means at opposite ends of said knives and permitting access to said screens for effecting simultaneous and equal adjustment of said knives relative to each other at both ends thereof.

12. A flock cutting machine comprising a rotary cutter, a plurality of stationary knives extending substantially from one end to the other of said cutter, adjusting means at each end of the machine for adjusting the corresponding ends of the knives relative to each other, and means of smaller diameter than said cutter for simultaneously actuating the adjusting means at both ends of the machine.

13. A flock cutting machine comprising a rotary cutter, an enclosing casing including a plurality of stationary knives arranged about the cutter and having their ends mounted for adjustment toward and from the cutter adjusting mechanism at opposite ends of the machine connected to the corresponding ends of all of said knives for adjusting the latter relative to each other, and means outside said casing for effecting simultaneous actuation of said adjusting mechanisms.

14. A flock cutting machine comprising an elongated rotary cutter, lag members spaced about the cutter and extending from one end to the other thereof, stationary knives supported upon said lag members, means adjustably supporting the opposite ends of said lag members including adjusting members positively connected to the lag members at each end thereof, and means for simultaneously actuating said adjusting members to effect simultaneous adjustment of said lag members with the knives thereon at both ends thereof.

15. A flock cutting machine comprising a rotary cutter, hollow lag members spaced about the cutter and extending from one end to the other thereof, stationary knives supported upon said lag members, means adjustably supporting the opposite ends of said lag members for adjusting said members relative to one another including adjusting members positively connected to the lag members at each end thereof, and means for simultaneously actuating said adjusting members to effect simultaneous adjustment of said lag members relative to one another with the knives thereon at both ends thereof, said lag members being hollow for the passage of a cooling fluid therethrough and having connections for supplying cooling fluid thereto in all positions of adjustment thereof.

16. A flock cutting machine comprising a pair of end frames, a rotating cutter mounted between said frames, said frames having a plurality of generally radially disposed slots therein, a plurality of lag members disposed about the periphery of the cutter, each having protruding ends mounted in certain of said slots, and means acting on said ends for adjusting the lag members within said slots toward and from the cutter.

17. A flock cutting machine comprising a pair of end frames, a rotating cutter mounted between said frames, said frames having a plurality of generally radially disposed slots therein,

a plurality of lag members disposed about the periphery of the cutter, each having ends protruding beyond ends of the cutter and mounted in certain of said slots, and positive means for adjusting the lag members within said slots toward and from the cutter and supporting said lag members in adjusted position.

18. A flock cutting machine comprising a pair of end frames, a rotating cutter supported between said frames, knife-supporting lag members having their ends adjustably carried by said frames, an adjusting member mounted on one of said end frames, and means connecting said member with the corresponding end of each of the lag members to effect adjustment of the latter.

19. A flock cutting machine comprising a pair of end frames, a rotating cutter mounted between said frames, knife-supporting lag members having their ends adjustably mounted respectively on said end frames, an adjusting member movably mounted on each of said end frames, and arm members connecting each of said adjusting members to the responsive ends of the lag members.

20. A flock cutting machine comprising a pair of end frames, a rotating cutter mounted between said frames, knife-supporting lag members having their ends adjustably mounted respectively on said end frames, an adjusting member movably mounted on each of said end frames, arm members connecting each of said adjusting members to the respective ends of the lag members, and means for moving said adjusting members simultaneously to effect adjustment of the lag members at both ends thereof.

21. A flock cutting machine comprising a pair of end frames, a rotating cutter mounted between said frames, knife-supporting lag members having their ends adjustably mounted respectively on said end frames, an adjusting member movably mounted on each of said end frames, and arm members connecting each of said adjusting members to the respective ends of the lag members, said adjusting member comprising a ring rotatable on said end frame, and said connecting arms extending radially from said ring to the respective lag members.

22. A flock cutting machine comprising a pair of end frames, a rotary cutter mounted between said frames, knife-supporting lag members arranged in spaced relation about the periphery of the cutter and having their ends adjustably carried by said frames, an adjusting ring rotatably mounted on each of said frames about the cutter shaft, arms connecting said rings with the respective ends of the lag members to support the latter, a shaft having a crank thereon adjacent each end frame, means connecting the cranks with said rings, and an operating member for rotating said shaft to adjust the ends of said lag members at both ends of the machine.

23. A flock cutting machine provided with a rotary cutter and spaced knife-supporting lags about said cutter, stationary knives supported on said lags, screen frames positioned between said lags having screen members thereon individually removable from between the lags, and means for adjusting said lags and the knives thereon toward and from said cutter relative to said screen frames and screens.

24. A flock cutting machine comprising end frames, spacing bars extending from one of said frames to the other, a rotary cutter mounted in said frames, knife-supporting lag members carried by said frames, stationary knives on said lag members, screens mounted between said lag members and removably connected to said spacing bars and means for adjusting said lags and the knives thereon toward and from said cutter relative to said spacing bars and screens.

25. A flock cutting machine comprising a pair of end frames, a shaft rotatably mounted in said frames, a pair of end heads secured to said shaft, a cutting cylinder disposed between said heads and secured thereto filling the space between said end frames, stationary cutting knives cooperating with and radially disposed completely around said cylinder, means for feeding material to said cylinder and stationary knives, and radially located closed passages between said stationary knives having screens communicating with said cylinder, said passages delivering longitudinally through one of said end frames.

26. A flock cutting machine having a rotary cutter comprising a cylindrical member having grooves disposed generally longitudinally of its periphery surface to provide between adjacent grooves integral longitudinally extending substantially radially projecting abutments having leading faces and rearwardly extending faces providing shearing edges on the periphery of said cylinder, and a coating of hard metal on said leading faces, the portions of said abutments adjacent said shearing edges on said rearwardly extending faces remaining uncoated for sharpening purposes.

27. A flock cutting machine having a rotary cutter comprising a cylindrical member having grooves disposed generally longitudinally of its peripheral surface to provide between adjacent grooves integral longitudinally extending substantially radially projecting abutments having leading faces and rearwardly extending faces providing shearing edges on the periphery of said cylinder, and a coating of hard metal on said leading faces, the portions of said abutments adjacent said shearing edges on said rearwardly extending faces remaining uncoated for sharpening purposes, said coating comprising an alloy containing cobalt and chromium.

28. A flock cutting machine comprising a rotary shearing cutter cylinder, means forming a housing about said cylinder comprising alternately disposed knife-supporting lags and collecting chambers for receiving the finely cut material, stationary shearing knives supported on said lags and adjustable relative to each other to cooperate with the rotary cylinder, and screens on said chambers between knives on adjacent lags.

29. A flock cutting machine comprising a rotary shearing cutter, a series of knife-supporting radially adjustable lag members disposed in spaced relation about the periphery of the cutter, screen members supported in the spaces between said lag members and arranged alternately therewith, and stationary shearing knives supported on and adjustable with said lag members relative to each other to cooperate with the rotary cutter.

30. A flock cutting machine comprising a rotary shearing cutter, a series of water-cooled knife-supporting lag members disposed in spaced relation about the periphery of the cutter, screen members supported in the spaces between said lag members and arranged alternately therewith, and stationary shearing knives cooled by and supported on said lag members and adjustable relative to each other to cooperate with the rotary cutter and disposed between said lag members and adjacent screens.

31. A flock cutting machine comprising a rotary shearing cutter and means forming a closed chamber about said cutter comprising a series of shearing knife-supporting lag members arranged in spaced relation about the periphery of the cutter, screen members disposed in the spaces between said lag members and arranged alternately therewith, and means to adjust said lag members relative to each other toward and from said cutter from the exterior of said closed chamber.

32. A flock cutting machine comprising a rotary cutter and means forming a knife structure about said cutter having a series of knives arranged in spaced relation about the periphery of said cutter, and an enclosing structure including a plurality of non-communicating peripherally arranged collecting chambers, each chamber having a separate connection for withdrawing material from said chamber, and said chambers having screen members removably disposed in spaces between said knives, and means to enable removal of said screens from the exterior of said chambers including covers openable independently of said screens.

33. A flock cutting machine having a rotary cutter, a stationary knife structure including a plurality of stationary knives surrounding said cutter, and an enclosing structure including a plurality of non-communicating peripherally arranged collecting chambers, each chamber having a separate connection for withdrawing material from said chamber, said chambers having screens removably mounted between said knives, and cover means covering said screens and openable independently thereof and of all of said stationary knives and cooperating with said knife structure to form an enclosing casing.

34. A flock cutting machine having end frames, a rotary cutter journalled therein, a stationary knife structure carried by said frames including a plurality of stationary knives surrounding said cutter, screens removably mounted between said knives, cover means covering said screens and openable independently thereof and cooperating with said knife structure to form an enclosing casing, and means delivering through one of said end frames and communicating with the space between said cover means and screens through which the screened material may be withdrawn.

35. A flock cutting machine comprising a rotary cutter and means forming a closed chamber about said cutter comprising alternately spaced adjustable knife-supporting lag members and screen members permitting the passage of the cut material therethrough, means for radially adjusting said lag members relative to each other, and a shearing knife supported upon each of said lag members to cooperate with the rotary cutter and adjustable with said lag member relative to said screen members.

36. A flock cutting machine comprising a rotary cutter, means forming a peripherally disposed enclosure about said cutter comprising a series of non-communicating peripherally arranged chambers, said means supporting stationary knives for cooperation with the cutter, and means for withdrawing the finely cut material having separate connections for each chamber and including a plurality of screens and openable covers forming a part of said enclosure and permitting access to said screens from the exterior of said enclosure while said screens and knives remain in operative position relative to said cutter.

37. A flock cutting machine comprising a rotary cutter, an enclosure including a plurality of non-communicating peripherally arranged collecting chambers disposed about the periphery of the cutter to permit withdrawal of the finely cut material therefrom, each chamber having a separate connection for withdrawing material from said chamber and each chamber comprising a screen adjacent the cutter and a member rearwardly of, and spaced from, said screen to form, in conjunction therewith, the collecting chamber, and means for permitting access to said screens in said chambers from the exterior of said enclosure while said screens remain in operative position relative to said cutter.

38. A flock cutting machine comprising a rotary cutter and a plurality of non-communicating peripherally arranged collecting chambers for the finely cut material disposed about the periphery of the cutters, each of said chambers having a separate connection for withdrawing material from said chamber and each of said chambers being formed by a screen member disposed adjacent the cutter, and a cover member spaced from the screen member on the opposite side thereof from the cutter, and said cover member being hinged to permit the opening thereof independently of said screen and while said screens remain in operative position relative to said cutter.

39. A flock cutting machine comprising a rotary cutter, an enclosure including a plurality of non-communicating peripherally arranged collecting chambers disposed about the periphery of the cutter to permit withdrawal of the finely cut material therefrom, each chamber having separate connections for withdrawing material from said chamber and each chamber comprising a screen adjacent the cutter and an independently openable cover member rearwardly of, and spaced from, said screen to form, in conjunction therewith, the collecting chamber, frames independently of said cover members supporting said screens in operative relation to said cutter while said cover members are open, and means for enabling removal of said screens from the exterior of said enclosure while said cover members are open.

40. A flock cutting machine comprising a pair of end frames, a rotary cutter disposed between and rotatably supported by said frames, a plurality of hollow water-cooled lag members having their ends adjustably mounted on said end frames, and a knife secured upon each side of each of said lag members, and said lag members being arranged in spaced relation about said rotary cutter.

41. In a flock cutting machine, a rotary cutter, a cooperating series of stationary knives arranged around the periphery of said cutter, a frame carrying said cutter and having elongated knife carrying lag members disposed in spaced relation to one another around the periphery of said cutter, said lag members having oppositely disposed knife engaging faces and knives on said faces of each lag member, means for attaching said knives to the knife engaging faces of said lag member, and means for adjusting said knives relative to said cutter while maintaining the fixed relation of the knives on each lag member relative to the latter including unitary means for bodily adjusting each of said lag members simultaneously at the opposite ends thereof radially relative to said cutter with the knives attached thereto.

42. In a flock cutting machine, a rotary cutter,

a cooperating series of stationary knives arranged around the periphery of said cutter, a frame carrying said cutter and having elongated knife carrying lag members disposed in spaced relation to one another around the periphery of said cutter, said lag members having oppositely disposed knife engaging faces and knives on said faces of each lag member, each of said knives being spaced substantially from an adjacent lag member and the adjacent knife thereon, and means for attaching said knives to said lag members, said lag members having cooling water passage means extending longitudinally thereof between said knife engaging faces for cooling said knives substantially throughout their length.

ANDREW HAUGE.

CERTIFICATE OF CORRECTION.

Patent No. 2,145,177. January 24, 1939.

ANDREW HAUGE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, line 4, for the word "machine" read machines; page 2, first column, line 68, for the words "there to my" read thereto by; page 4, second column, line 27, claim 13, after "cutter" insert a comma; line 28, same claim, for "mechanism" read mechanisms; page 5, first column, line 23, claim 19, for "responsive" read respective; line 66, claim 23, before "individually" insert and; and second column, line 22, claim 26, for "periphery" read peripheral; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of April, A. D. 1939.

Henry Van Arsdale

(Seal) Acting Commissioner of Patents.