

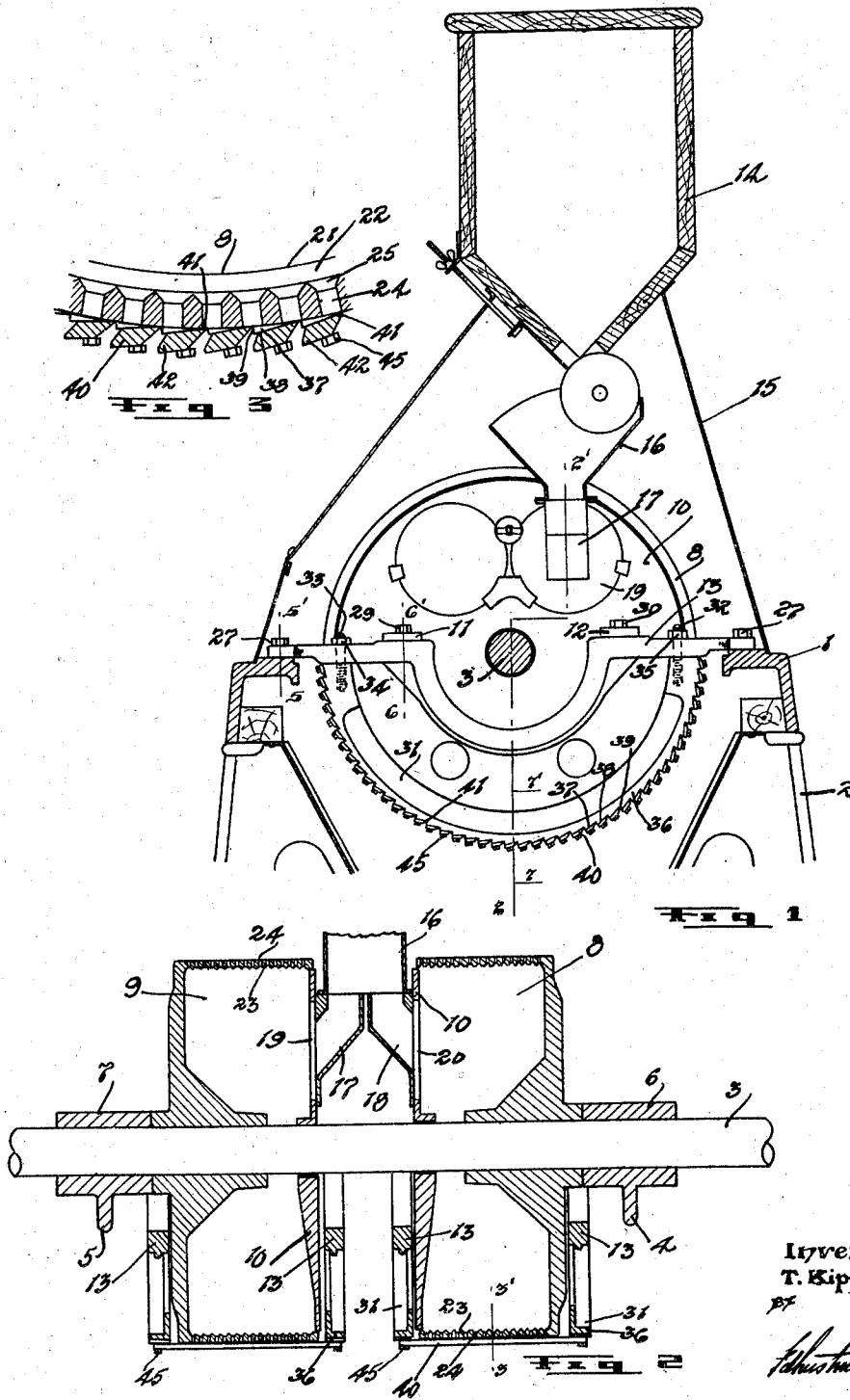
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GROAT CUTTER

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GROAT CUTTER

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The invention relates to improvements in groat cutters and more particularly to that type of machine wherein a rotary perforated drum is utilized to receive the groats and cutting knives arranged around the periphery of the drum are provided for cutting the groats and the invention resides more particularly in the knives and mountings for the same and an object of the invention is to provide a structure which permits of the ready mounting or removal of the individual knives or the ready removal of a complete set of knives in order to permit of the substitution therefor of another set of knives.

A further object is to provide a structure which will support both ends of the knives and which is arranged so that the set of knives can be adjusted endwise to present a new cutting edge in respect to the perforations of the drum.

A further object of the invention is to provide an arrangement whereby the machine can be readily changed to cut the groats finer or coarser as occasion demands and without requiring a new set of knives but simply a new set of knife holders which can be supplied at comparatively small cost.

With the above more important objects in view, the invention consists essentially in the arrangement and construction of parts hereinafter more particularly described, reference being had to the accompanying drawings, in which:—

Fig. 1 is a vertical sectional view through the frame of a machine embodying my invention and showing the drum, the knives and the supports for the same in end elevation.

Fig. 2 is a vertical sectional view at 2—2' Figure 1.

Fig. 3 is an enlarged detailed vertical sectional view at 3—3' Figure 2.

Fig. 4 is a perspective view of one of the knives.

Fig. 5 is an enlarged detailed vertical sectional view at 5—5' Figure 1.

Fig. 6 is an enlarged detailed vertical sectional view at 6—6' Figure 1.

Fig. 7 is an enlarged detailed vertical sectional view at 7—7' Figure 1.

Fig. 8 is an enlarged detailed sectional view through a portion of the drum and several knives and showing in dotted outline two other positions of the knives and how the variation in the angular position of the knives effects the length of cut of the groat.

In the drawings like characters of reference indicate corresponding parts in the several figures.

The main frame 1 of the machine is substantially rectangular and it is carried by suitable end legs 2. The machine can be built with several perforated drums all mounted on the common driven shaft 3 and with a set of knives for each drum and the frame will be made longer or shorter depending on the number of drums and knives used. I have herein shown only two drums and two sets of knives and supporting arms 4 and 5 extend across the frame to carry the shaft at suitable intervals, the arms being provided centrally with suitable bearings 6 and 7 for the shaft. In actual practice, two drums are mounted between each pair of bearings 6 and 7 (see Figure 2).

The drums 8 and 9 which are arranged in pairs between the bearings 6 and 7 each have one end permanently closed and the other end open. The open end of the drum in each instance is closed by a stationary disc-like head 10 and each head is fitted with outstanding lugs 11 and 12 which are supported by a saddle or cross arm 13 carried by the frame. The saddle is downwardly arched centrally to escape the shaft. Here it will be observed that the stationary heads appear in spaced pairs with their inner faces opposing and their outer edges making sliding contact with the open ends of the drum cylinders.

The groats are fed into the adjacent drums from a top feed box 14 suitably supported

from the frame by an enclosing casing 15. The bottom of the feed box is of a hopper shape and feeds to a funnel 16, the bottom of which is provided with chutes 17 and 18 which communicate with suitable openings indicated at 19 and 20 in the stationary heads and feeding to the interior of the drums. Interiorly the shell or cylinder of each drum is circumferentially corrugated as indicated at 21 to provide similar channels 22 separated by V-shaped ribs 23. In the base of each channel I drill a plurality of equi and suitably spaced holes 24 and after having drilled the holes, I counter sink or enlarge the inner end of each hole as indicated at 25. The holes are of such a size that they will allow a kernel to pass there through end on and the channels and counter sinks co-act to effectively line the kernels and up end them into the holes when the machine is working.

Obviously as the shaft 3 is rotated the drums will turn therewith whilst the heads 10 will remain stationary and the kernels fed to the drum from the feed box will be passed end on through the openings or perforations in the drum cylinder.

The saddles or cross bars 13 are attached to the frame so that they can be laterally adjusted, that is, moved towards or away from the drum and to this end each end of the saddle is provided with a transverse slot 26 through which a jam screw 27 passes, the jam screw screwing into the frame. The head of the jam screw is considerably larger than the width of the slot so that when the jam screws are tightened up they hold the saddles in any adjusted position. The heads 10 are also adjustably attached to the saddles, this being accomplished by providing the lugs 11 and 12 of the heads with lengthwise extending slots 28 which receive jam screws 29 and 30 passing through the lugs and into the saddles.

Each saddle supports a knife holder 31, there being a pair of holders for each drum. The holders are all similarly constructed and are semi-circular and concentric to the shaft 3 and are of such a radius that the cutting edges of the knives hereinafter described operate over the periphery of the drum. The ends of the knife holders butt the under sides of the cross bars, saddles or bridges 13 and they are detachably secured thereto by screw threaded studs 32 and 33 carried by the ends of the holders and passing through the bridges and provided at their upper ends with fastening nuts 34 and 35.

The knife holders present rims 36 concentric to the shaft and the outer faces of the rims are formed each with a continuous row of teeth 37, each tooth presenting an inclined bearing face 38 and a shoulder 39. The teeth of the pair of holders associated with each drum are identical and oppositely disposed and to the opposing teeth of the holders, I secure cutting knives 40, the cutting knives

being all similar and presenting a forward cutting edge 41 and a slanting heel 42. The ends of each cutting knife are fitted with screw holes 43 and 44 through which similar fastening screws 45 pass, the screws fastening the knife to the rims of the holders. Here it will be observed that the end of the knife seats on the bearing face 38 of the tooth and that the cutting edge of the knife terminates at the shoulder of the adjacent tooth.

From the above construction, it will be apparent that the teeth of the holders hold the knives in an angular position in respect to the drum and that the heel of any one knife is outwardly spaced from the cutting edge of the adjacent knife. According to this arrangement, it will be apparent that the radial distance between the heel of the knife and the outer face of the drum controls the depth of cut of the kernel and that the distance between the heel and cutting edge of adjacent knives controls the amount of clearance space given for the cut kernel to escape from between the knives.

In order that the above may be clearly understood, I will refer particularly to Figure 8 and point out that the distance between the point H of the knife heel and the point D of the drum controls the depth of cut of the kernel 46 and the distance from the point H to the point E, which latter is the cutting point of the knife, represents the clearance space given for the cut kernel to escape. This latter distance at all times must be equal to or greater than the distance H—D as otherwise the cut kernel will be jammed between the knife edge and the heel and will not escape freely.

In Figure 8 of the drawings, I have shown a number of knives positioned in different angular relation to the drum and have indicated how by varying the distance between the heel of the knife and the face of the drum, I can readily control the depth of cut of the kernel. If the heel of the knife be closer to the face of the drum, the kernel will be cut shorter than if it be farther away. I might here explain that it is desirable in machines of this kind to be able to cut kernels finer or coarser as occasion demands and without requiring to make extensive alterations in the machine structure.

According to the structure herein disclosed, it is only necessary to provide knife holders having teeth of different pitch to which the knives can be attached. If a pair of holders is being used which will cause the knives to cut the kernel coarse and it is desired to cut the kernel finer, it is only necessary to utilize a further pair of holders having the shoulders of the teeth less and attach the knives utilized with the previous holders and then remount the selected holders and attached knives on the machine. Such an arrangement avoids having to supply a new set of knives for each

drum and permits of the comparative quick changing of the machine for short, long or intermediate cutting as the occasion demands.

I might explain further that before a groat or kernel of grain leaves the machine it may be cut say anywhere from two to seven times by successive knives, the coarseness or fineness of the cut depending on the particular holders selected. As soon as the kernel is up ended in a hole or perforation of the drum, it slips through until the point thereof strikes the inner face of the knife. As the drum rotates and carries the kernel with it, it sweeps the standing kernel over the latter face of the knife and as such face is inclined, the kernel drops or moves endwise under the combined action of gravity and centrifugal force until it reaches the heel of that knife at which time it is cut by the cutting edge of the following knife. Having been cut, the action is repeated, the kernel continuing to travel on the inner face of the succeeding knife and slip endwise until it is again cut by the following knife and this action is continued until the kernel is fully cut.

Obviously the number of cuts per kernel will depend on the ratio of the distance H—D to the length of the kernel.

I have hereinbefore stated that the knives are adjustable. This is brought about by laterally shifting the knife holders to simultaneously end shift the knives in respect to the drum and such is accomplished by releasing the jam screws 27 to permit the saddles or bridges to be laterally shifted. The value of so end shifting the knives is to present new sharp edges to the drum as it will be readily observed that those parts of the knives directly opposing the drum perforations will become dull whilst there are still unused sharp portions of the knives between the perforations. By end shifting the knives, these sharpened portions are presented to the perforations and the dull portions are passed away there from. Any time the saddles or bridges are shifted as above explained, one will re-adjust the position of the heads 10 in respect to the drums, the adjustment being made by releasing the jam screws 29 and 30.

What I claim as my invention is:—

1. In a groat cutting machine, the combination with a rotary perforated drum, of a plurality of cutting knives located at the outer face of the drum and extending lengthwise thereof and simultaneously adjustable endwise on the drum.

2. In a groat cutting machine, the combination with a rotary perforated drum, of a plurality of cutting knives located at the outer face of the drum and extending lengthwise thereof and end supports carrying the knives, said supports being adjustably mounted to permit of the simultaneous endwise shifting of the knives.

3. In a groat cutting machine, the combi-

nation with a stationary frame and a rotatably mounted perforated drum, of knife holders located at the ends of the drum and concentric thereto, means supporting the knife holders adjustably from the frame to permit of their movement towards or away from the ends of the drum and cutting knives secured to the holders and operating over the face of the drum.

4. In a groat cutting machine, the combination with a stationary frame and a rotatably mounted perforated drum, of cross bars located at the ends of the drum and carried by the frame, means adjustably fastening the ends of the bars to the frame to permit of their adjustment towards or away from the ends of the drum, knife holders secured to the cross bars, the said knife holders being positioned at the ends of the drum and being concentric thereto and a plurality of similar lengthwise extending knives operating on the face of the drum and secured to the knife holders.

5. In a groat cutting machine, the combination with a stationary frame and a rotatably mounted perforated drum, of cross bars located at the ends of the drum and carried by the frame, means adjustably fastening the ends of the bars to the frame to permit of their adjustment towards or away from the ends of the drum, knife holders detachably secured to the cross bars and located at the ends of the drum and concentric thereto and a plurality of similar knives extending lengthwise of the drum and operating over the outer face thereof and having their ends detachably secured to the knife holders.

6. In a groat cutting machine, the combination with a stationary frame and a rotatably mounted perforated drum carried thereby, of knife holders located at the ends of the drum and supported from the frame, said knife holders being concentric to the drum and having the peripheral faces thereof presenting a row of teeth and cutting knives extending lengthwise of the drum and operating over the outer face thereof and having their ends mounted on and fastened to opposing teeth of the holders.

7. In a groat cutting machine, the combination with a main frame and a rotatably mounted cylindrical perforated drum carried by the frame, of similar knife hangers located at the ends of the drum and concentric thereto and supported by the frame, said knife holders each presenting inclined knife receiving faces and cutting knives operating over the outer face of the drum and passing lengthwise thereof and having their ends secured to the inclined faces of the holders.

8. In a groat cutting machine, the combination with a stationary frame and a cylindrical perforated drum rotatably carried by the frame and having one end closed and the other end open, of cross bars carried by the

frame and located at the ends of the drum and adjustable towards and away from the drum, an arcuate knife holder secured to each cross bar, knives operating on the outer face of the drum and passing lengthwise thereof and carried by the knife holders and a closure head for the open end of the drum, said head being adjustably carried by one of the cross bars.

10 Signed at Winnipeg this 5th day of March, 1926.

THEODORE KIPP, JR.

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