Aug. 15, 1967 K. LEDERGERBER 3,335,771

VENEER CHIPPER

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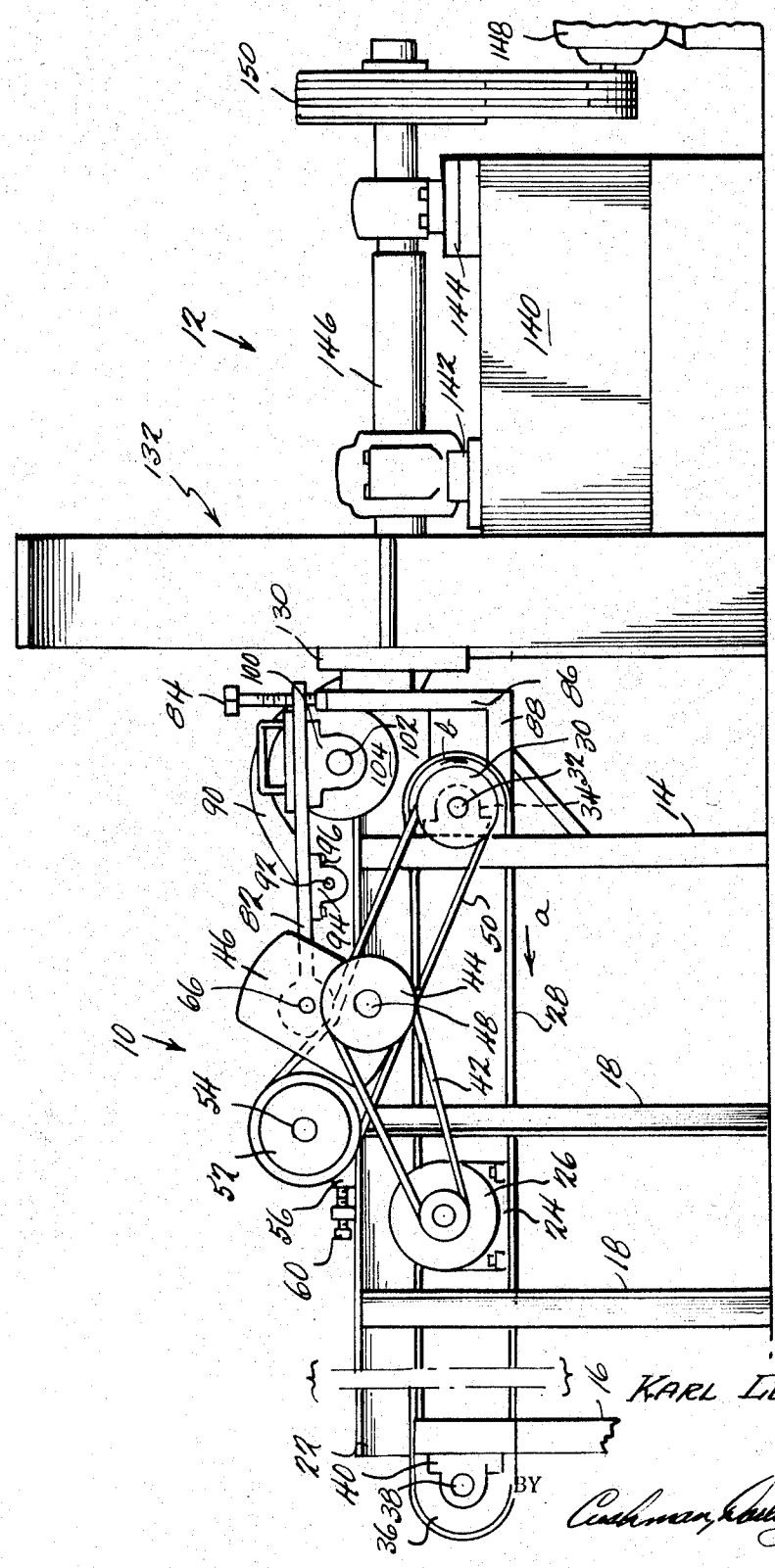


Fig. 1

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Aug. 15, 1967 K. LEDERGERBER 3,335,771

VENEER CHIPPER

Filed July 8, 1965 7 Sheets-Sheet 2

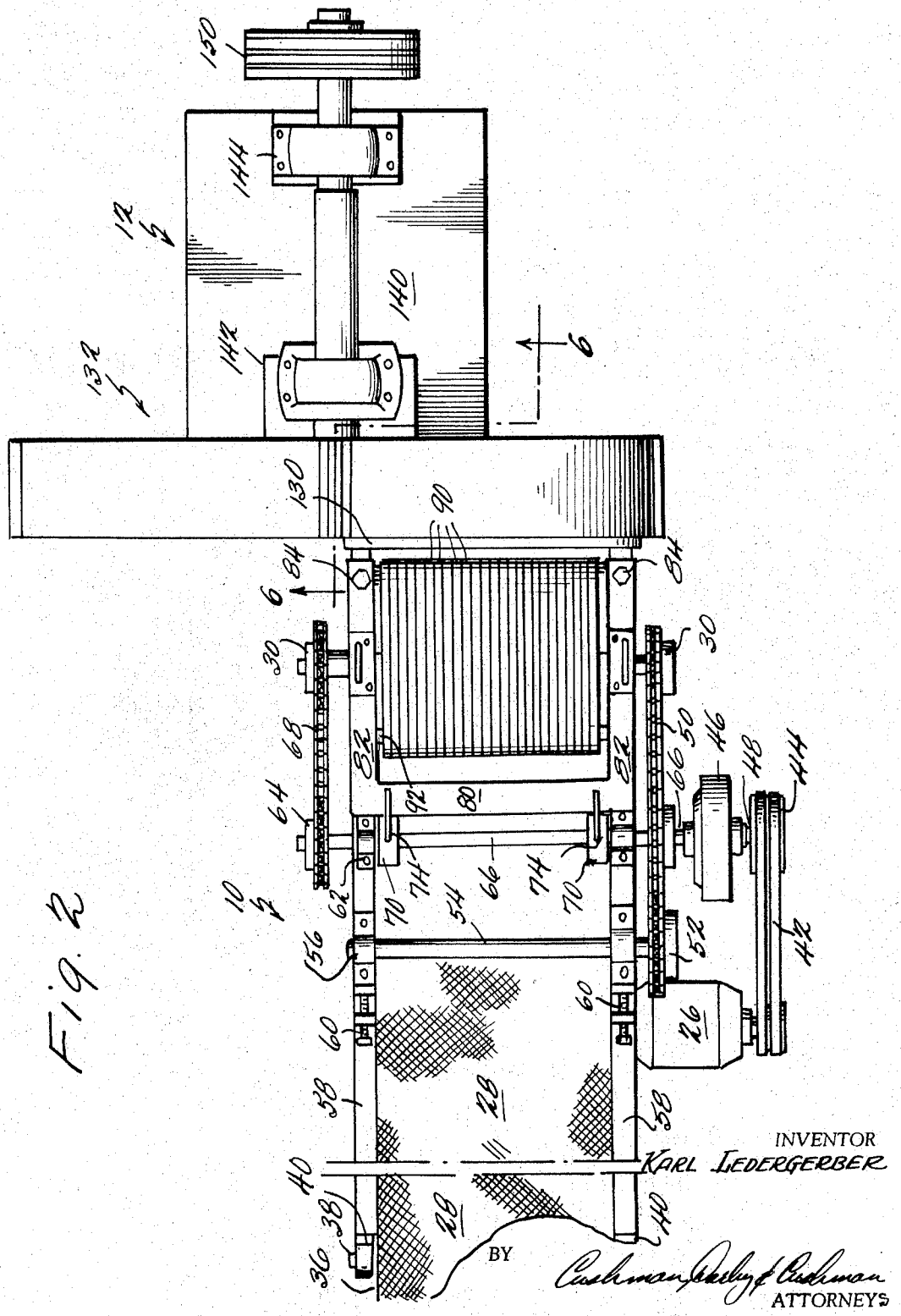


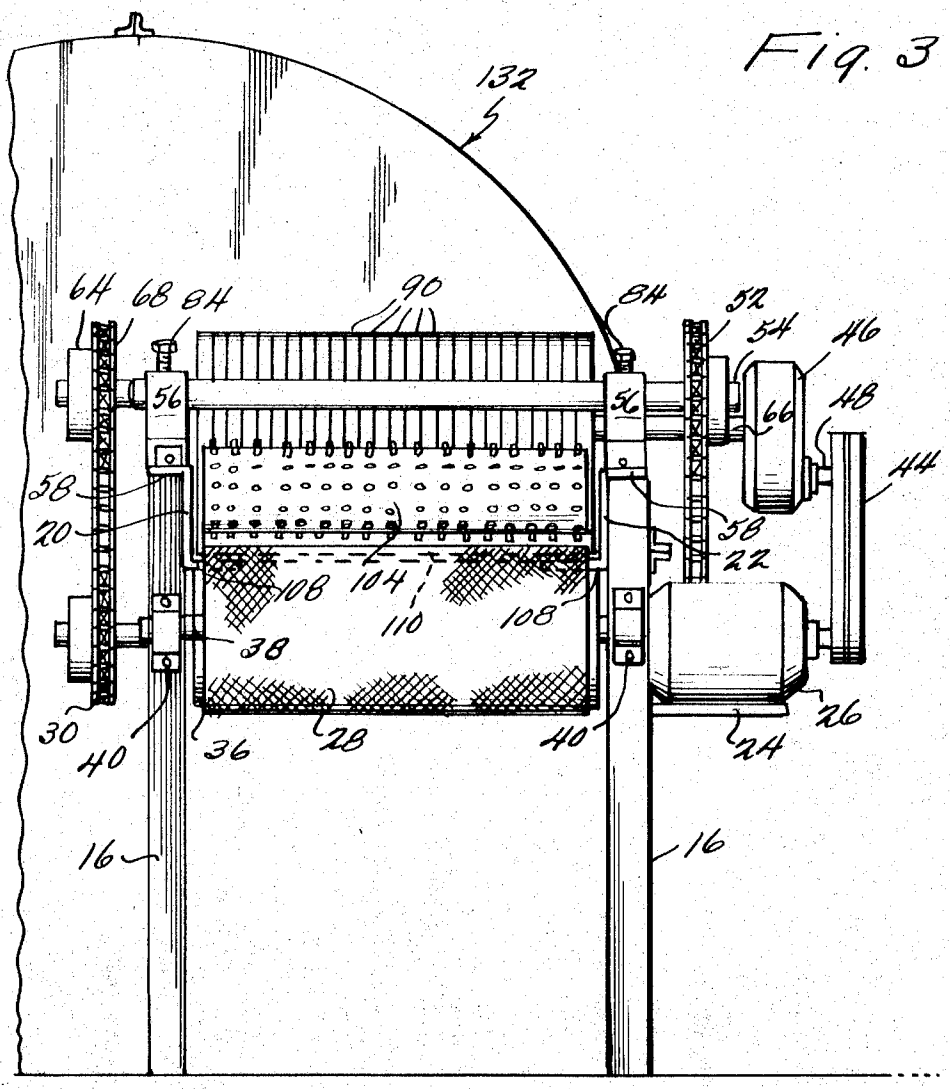
Fig. 2

Aug. 15, 1967 K. LEDERGERBER 3,335,771

VENEER CHIPPER

Filed July 8, 1965 7 Sheets-Sheet 3

Fig. 3



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VENEER CHIPPER

Filed July 8, 1965 7 Sheets-Sheet 4

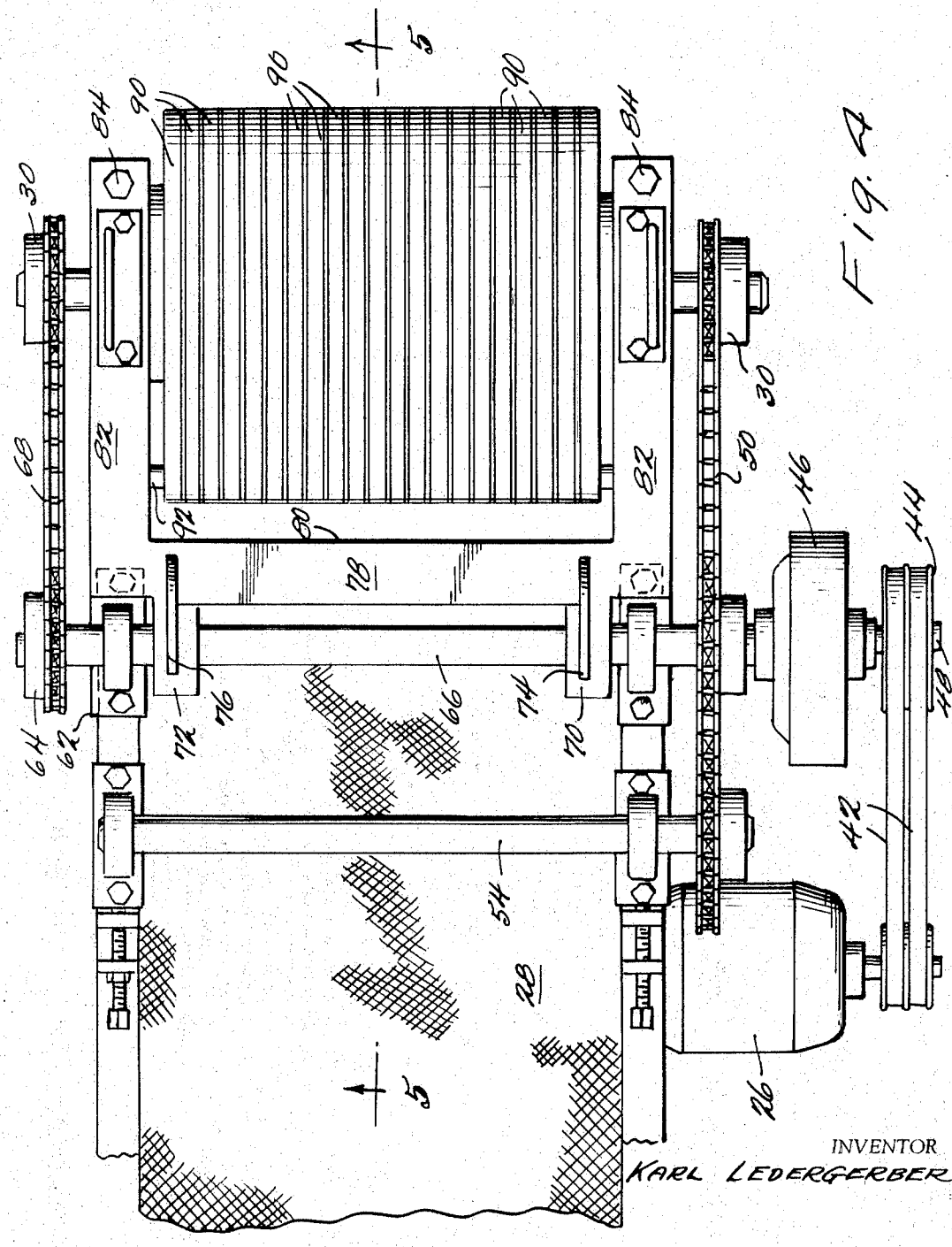


Fig. 4

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Aug. 15, 1967 K. LEDERGERBER 3,335,771

VENEER CHIPPER

Filed July 8, 1965 7 Sheets-Sheet 5

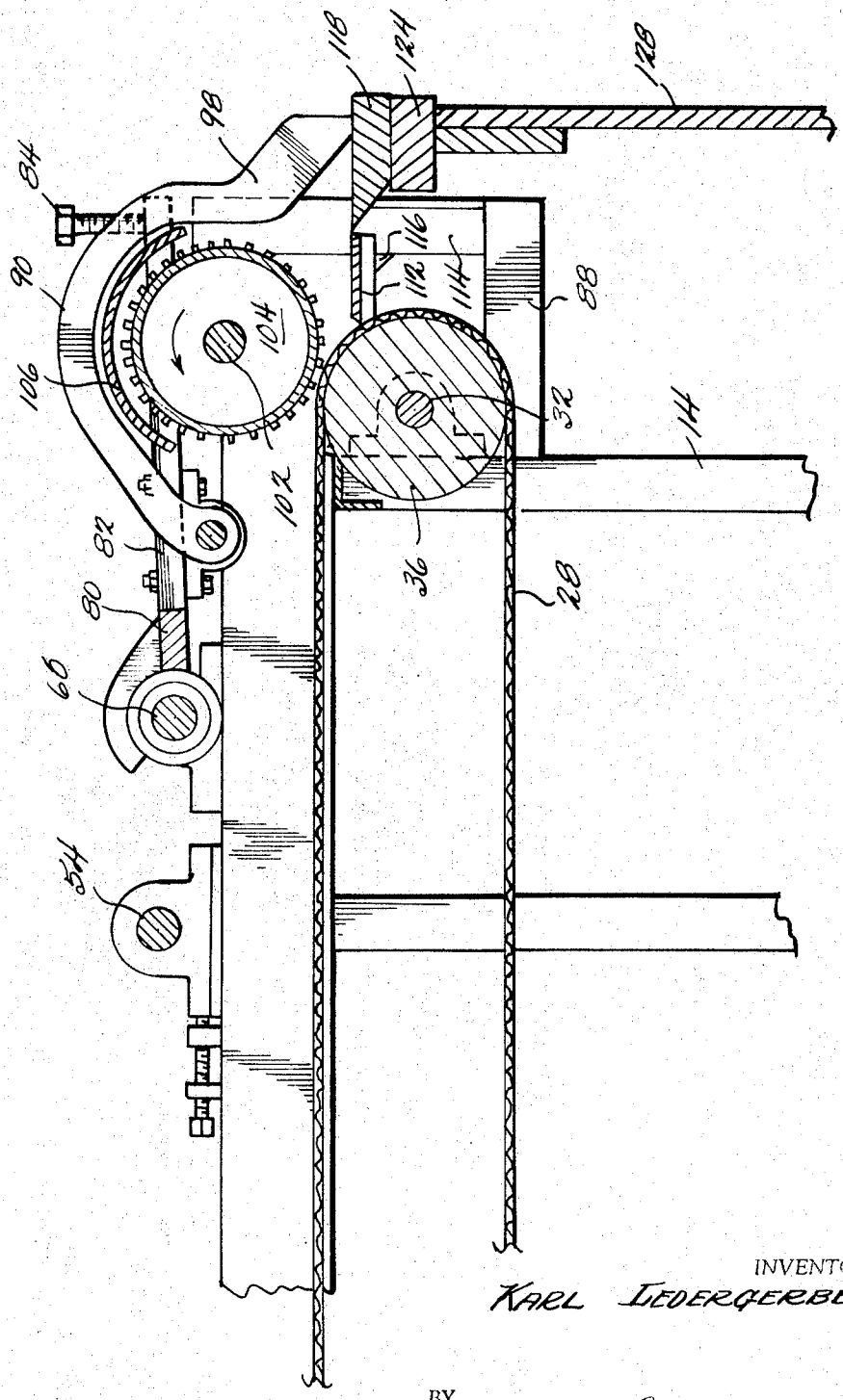


Fig. 5

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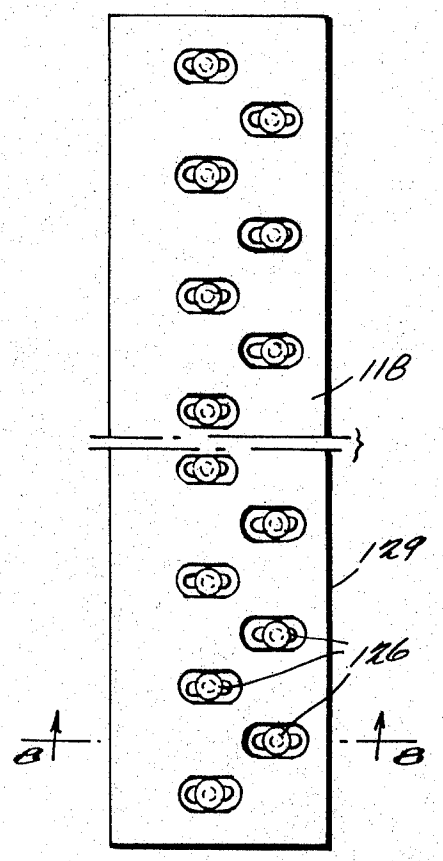
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Aug. 15, 1967 K. LEDERGERBER 3,335,771

VENEER CHIPPER

Filed July 8, 1965 7 Sheets-Sheet 6

Fig. 7



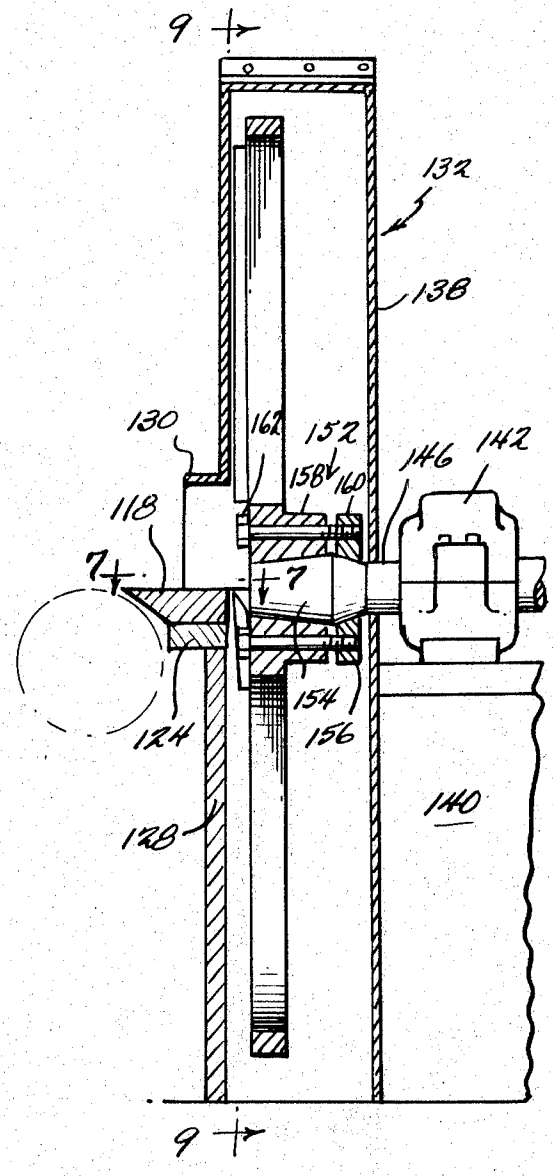
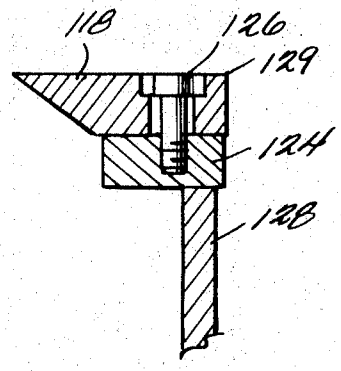


Fig. 6

Fig. 8



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Aug. 15, 1967 K. LEDERGERBER 3,335,771

VENEER CHIPPER

Filed July 8, 1965 7 Sheets-Sheet 7

Fig. 9

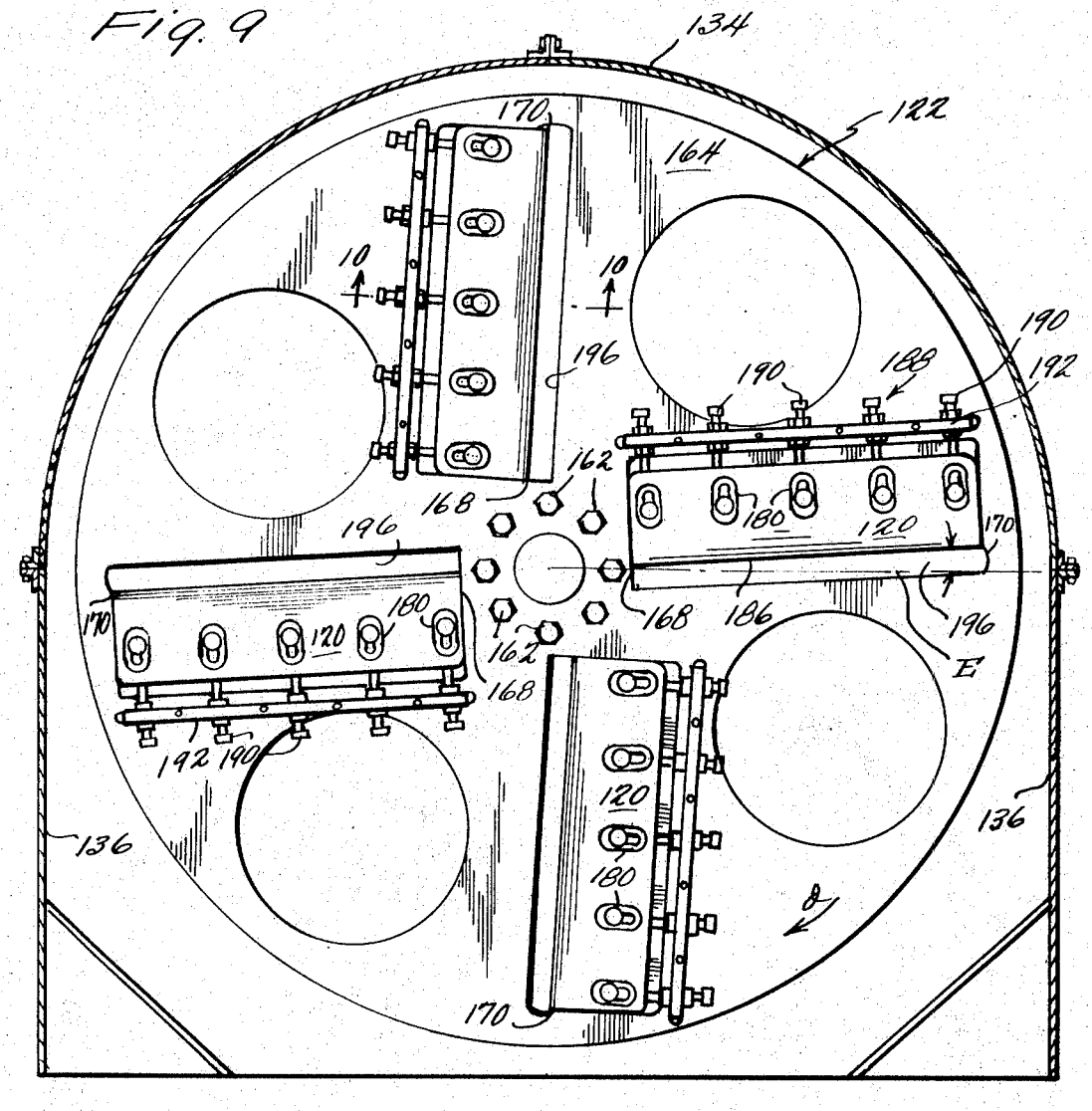
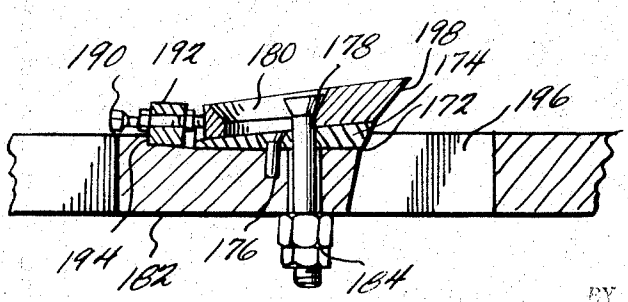


Fig. 10



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United States Patent Office 3,335,771
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3,335,771

VENEER CHIPPER

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Filed July 8, 1965, Ser. No. 470,444
14 Claims. (Cl. 144—176)

This invention relates to certain improvements in machines for producing wood chips.

More particularly, this invention relates to improvements in a wood chipping machine for producing wood chips from random size pieces of wood such as veneer scrap (veneer round-up scrap).

Still more particularly, this invention relates to wood chipping machines of the kind having a rotatable chipper disk carrying a plurality of radially spaced cutter knives, the angular orientation of the individual knives to each other being predetermined whereby in operation the veneer scrap is maintained in position for efficient chipping.

In the wood pulp industry it is necessary to reduce wood stock to a chip form. It is desirable in producing such chips to obtain a chip product which has certain uniform characteristics of size and quality in order to provide for better cooking characteristics of the chip products. Therefore, it is important that the wood stock be cut cleanly with little bruising or squeezing of the resulting product. It is also important to obtain a uniform product at a maximum rate of production.

Heretofore machines adaptable for chipping veneer round-up scrap to produce a chip product have utilized a rotary disk chipper wherein the disk is mounted for rotation in a vertical plane and wherein a plurality of knives are positioned on one face of the disk. The knives coact with a stationary bed knife or anvil in such a way that a scissors action results between the rotating knives and the stationary anvil. The wood stock usually fed to the chipper disk is in the form of veneer round-up, or in certain instances as in rechipper machines in the form of slivers or chunks. Depending on the form of the wood stock, certain provisions have been made in prior art devices for delivering the wood stock to the vicinity of the chipper disk. None of these prior art devices has, however, provided an apparatus for efficiently producing a wood chip from a relatively thin slab of wood such as veneer scrap where, in combination, the means for delivering this particular wood stock to the chipper disk and a predetermined angular relationship of the individual knives on the chipper disk result in an effective chipping action to produce a desirable wood chip product.

It is therefore a principal object of the instant invention to provide various improvements in the construction of a rotary chipper device whereby maximum efficiency and the production of uniform chips from veneer scrap are assured.

Another object of this invention is to provide an improved rotary chipping disk provided with a plurality of knives, the individual knives having a predetermined angular relationship with each other whereby, in operation, uniform chips are produced from veneer scrap.

A further object of this invention is to provide a wood chipper with adjustable means for delivering veneer scrap to the cutting face of a rotary chipper disk whereby the knives on rotary chipper disk, because of their predetermined angular relationship with each other, maintain proper delivery of the veneer scrap toward the cutting path at all times.

Still another object of the instant invention is to provide an improved rotary wood chipper which comprises simple but sturdy parts cooperable to produce uniform chips from relatively thin wood stock such as veneer scrap without lodging or jamming therein and which will insure

free flow of the stock toward the cutting path at all times.

Further and more specific objects and advantages of the present device will be apparent from the following specification, taken in connection with the accompanying drawings in which like characters of reference refer to similar parts in the several views and in which:

FIGURE 1 is a side elevation of the device of the instant invention including the feeding assembly and the chipping assembly for chipping random sizes of wood stock;

FIGURE 2 is a top plan view of the device shown in FIGURE 1;

FIGURE 3 is an end elevation of the device shown in FIGURES 1 and 2;

FIGURE 4 is an enlarged fragmentary plan view of the feed assembly;

FIGURE 5 is an enlarged fragmentary longitudinal section of the feed assembly taken on line **5**—**5** of FIGURE 4;

FIGURE 6 is a vertical section through the chipper housing and mechanism substantially along the line **6**—**6** of FIGURE 2;

FIGURE 7 is a top plan view of the anvil taken along line **7**—**7** of FIGURE 6;

FIGURE 8 is an enlarged detail in section of the anvil taken on line **8**—**8** of FIGURE 7;

FIGURE 9 is a vertical section through the housing showing the chipper disk in elevation taken along the line **9**—**9** of FIGURE 6;

FIGURE 10 is an enlarged fragmentary detail of the knives taken along the line **10**—**10** of FIGURE 9 illustrating adjusting means of the knives.

Referring more in detail to the drawings, the improved wood chipper of this invention comprises, in combination, a feeding assembly **10** and a chipping assembly **12**. The feeding assembly **10** comprises, in combination, a support means, means to deliver random sizes of veneer scrap to the chipping assembly, and means to actuate the delivery means. The support comprises front and rear vertical upright members **14** and **16**, respectively, and preferably a pair of intermediate vertical upright members **18**. The upper ends of the vertical upright members are fixedly attached to a pair of longitudinally extending, spacedly removed Z-shaped members **20** and **22**.

Intermediate the upper and lower ends of intermediate vertical members **18** and fixedly attached thereto is a driving means brace **24** on which is supported driving means **26**, for instance, an electric motor for actuating a horizontally travelling endless conveyor belt **28** as shown in FIGURES 1 and 2. The conveyor belt **28** is driven by a pair of drive rolls **30** fixedly mounted on shaft **32** rotatably mounted in forward bearings **34**, which in turn, are fixedly mounted on forward vertical upright members **14**. A pair of rearward idler rolls **36** are fixedly mounted on rear shaft **38** journalled between rearward vertical uprights **16** through bearings **40** fixedly attached thereto.

The drive rolls **30** for the conveyor belt **28** are driven by driving means **26** through belt means **42**, pulley **44** which is operatively connected to reducer **46** through shaft **48**. The pulley **44** engages chain means **50** driven between one of the pair of forward conveyor belt drive rolls **30** and idler sprocket **52** which is fixedly mounted on shaft **54** extending transverse of the driving mechanism. Idler sprocket shaft **54** is rotatably mounted in bearings **56** which are movably mounted on outwardly disposed flange members **58** of Z-shaped members **20** and **22**. Chain means **50** between idler sprocket **52** and one of said forward drive rolls **30** can be adjusted by means **60** operatively connected to idler sprocket bearing **56** which permits the bearings to be displaced forwardly or rearwardly on the flange members **58**.

Rotatably mounted at one end to reducer **46** and at the other end to bearing **62** and sprocket **64** is shaft **66**. Sprocket **64** engages chain means **68** which also drives the second of the pair of forward conveyor belt drive rolls **30**.

Pivotably mounted on shaft **66** through collars **70** and **72** and reenforcingly supported by gusset plates **74** and **76** is C-shaped member **78** comprising transverse bar **80** provided at its outer ends with longitudinally extending leg members **82**. The outer ends of leg members **82** are provided with vertically adjustable screw means **84**, the lower end of which frictionally engages the upper surface of reverse L-shaped support means **86**, the horizontally disposed legs **88** of which are fixedly attached intermediate the ends of forward vertical upright members **14**. Extending longitudinally between leg members **82** are a plurality of hold down fingers **90** pivotably mounted on transversely extending shaft **92** journalled at its outer ends to leg members **82** through bearings **94** fixedly attached thereto through any convenient means such as bolts **96**. The forward ends **98** of hold down fingers **90** extend downwardly and outwardly to engage the random sized veneer scrap as it is fed to the chipping assembly **12**.

Fixedly mounted on the underside of each of the leg members **82** intermediate their outer ends and the hold down finger bearings **94** is bearing means **100** in which is journalled rotatable shaft **102** to which is fixedly mounted feed or doff roll **104**. Extending transversely above feed or doff roll **104** and fixedly attached at its outer ends to leg members **82** is arcuate shield member **106**.

Supported by the inwardly directed flange members **108** of Z-shaped members **20** and **22** and extending adjacent the rear of the conveyor belt **28** to adjacent the front of the conveyor belt is conveyor belt support means **110** comprising for instance, a longitudinally extending plate member.

An apron **112** is fixedly attached intermediate the ends of the vertically disposed leg **114** of reverse L-shaped support means **86** by bracket **116**. The rearward end of the apron is positioned adjacent the forward end of the drive roll **30** to receive the wood stock as it leaves the conveyor belt **28**. The forward end of the apron **112** is aligned with the upper surface of the anvil **118**.

The chipping assembly, comprises, in combination, an anvil, support means for the anvil, a rotary chipping disk, means for housing and supporting the rotary chipping disk and means for rotating the chipping disk.

Extending transversely and horizontally intermediate the leg members **82** is the stationary knife or anvil **118** which coacts with the individual knives **120** of the chipper disk **122** to produce a chip product from the scrap veneer fed to the cutting path of the disk. Horizontal anvil **118** is supported and fixedly attached to block **124** by any convenient means such as bolts **126** which, in turn, are supported to vertical upright member **128** which can suitably rest on the floor or any other convenient base member. The horizontal anvil **118** can be provided with a plurality of elongated holes through which bolts **126** pass thereby permitting forward and rearward adjustment of the leading edge **129** of the anvil to and away from the cutting edge of the knives secured to the chipping disk. This arrangement allows for gradual wear of the anvil during use thereby providing for continuous optimum chipping action.

The forward portion of stationary anvil **118** extends within a U-shaped shield member **130** projecting outwardly from the semi-cylindrically-shaped chipper disk housing or casing **132**. The crown portion **134** of the housing is detachably mounted to the vertical sidewalls **136** to permit easy access to the chipper disk. Also attached to the side walls in a rear wall **138** for the housing to which is attached the base structure **140**, the upper surface of which supports bearings **142** and **144**. The chipper disk driving arbor **146** is rotatably mounted in bearings **142** and **144** and operatively connected to the driving means **148** which conveniently can be an electric motor through a suitable connection such as the belt means **150**. The chipper disk **122** is mounted on the arbor's forward end **152** which comprises a pair of oppositely flaring conical surfaces **154** and **156** by a hub **158** engaging conical surface **154** secured to back-plate **160** engaging conical surface **156** by bolt means **162**.

Adjustably secured to the cutting face **164** of the chipper disk **122** are a plurality of chipper knives **120**. The knives **120** extend from the heel **168** thereof, radially from adjacent the center of the disk to the toe **170**, substantially adjacent the periphery of the disk **122**. The chipper disk is provided with a plurality of recesses **172** in which are mounted wedge-formed inserts **174** by, for instance, screws **176**. Over the wedge-formed inserts are positioned the knives **120**, thus causing them to be inclined in relationship to the face **164** of the chipper disk. The knives are secured to the chipper disk by bolts **178** extending through elongated bolt apertures **180** to the rear face **182** of the disk and nuts **184**. The elongated bolt apertures **180** provide for adjusting the knife at the desired angle thereby compensating for wear of the cutting edge **186** in use.

Remote from the cutting edge **186** of the knives **166** there is provided knife adjusting means **188** comprising a plurality of set screws **190** mounted in substantially radially extending bar **192** which is parallel to the cutting edge **186** of the knife. The bar **192** is fixedly mounted in recess **194** cut into the face **164** of the chipper disk.

An elongated substantially radially extending relief slot **196** is provided in the cutting disk adjacent the cutting edge of each knife and extends substantially the length thereof. The slot thus prevents build up of chip behind the outwardly inclined surface **198** of the knife during use.

An important feature of the instant invention resides in the angular placement of the knives on the face of the chipping disk. As best seen in FIGURE 9, the heel **168** of one knife is presented to the anvil prior to presentation of the toe **170** thereto while the toe **170** of the immediately succeeding knife is first presented to the anvil prior to presentation of its heel **168** thereto. The presentation sequence is repeated for each suceeding knife. Generally, the cutting edge of the knife makes an angle of between about 1° to 6°, the angle alternately being included between the anvil edge and the heel of the knife's cutting edge and the anvil edge and the toe of the knife's cutting edge.

Because of the alternate initial presentation of the heel of one knife and the toe of the succeeding knife, the random size veneer scrap is maintained centered with respect to the rotating chipper disk. Thus while one knife in its shearing action tends to move the scrap outwardly, this action is counteracted by the action of the succeeding knife which tends to move the stock inwardly.

In operation, the motor **26** is energized to actuate the feeding assembly **12**. Thus the conveyor belt **28** is caused to travel in the direction of the arrow *a*, as shown in FIGURE 1, the forward drive roll **30** moving in the direction of the arrow *b*, also shown in FIGURE 1. The veneer scrap which is random in size, i.e., with relation to its length, width or thickness, travels along the moving endless belt from a position adjacent the rearward portion of the belt to a position adjacent the forward end where it is contacted by feed or doff roll **104** rotating in the direction of the arrow *c*, as seen in FIGURE 5. The veneer scrap is conducted from the conveyor belt **28** to the upper surface of apron **112** and caused to move under the weighted, forward portion **98** of hold down fingers **90** as it passes over the upper surface of the anvil, or stationary knife, **118**, for presentation to the cutting face of the chipper disk **122**.

The hold down fingers **90** which are pivotably mounted to a pivotable C-shaped member **78** are individually vertically adjustable to compensate for the random size

of the veneer stock which is to be chipped by the chipper disk **122**. The anvil **118** extends horizontally half the diameter of the chipper disk **122**, the anvil line being shown at E in FIGURE 9.

On energization of the motor **26** of the feeding assembly **10**, the motor **148** of the chipper assembly **12** is energized to rotate chipper disk arbor **146** through belt means **150**. The chipper disk **122** rotates in a direction *d*, as shown in FIGURE 9.

As the veneer stock on the upper surface of anvil **118** is presented to the face **164** of the chipper disk **122**, the cutting edge **186** of knives **120** coact with the leading edge **129** of the anvil **118** to produce a scissors-like action to chip the stock into uniform chip product. As can best be seen from FIGURE 9, the heel **168** of the cutting edge **186** of a first knife **120** engages the stock initially, there being a predetermined angle made between the cutting edge **186** of the knife **120** with the anvil line E. The continued rotation of the chipper disk **122** produces a scissors-like action thus effectively reducing the stock to a uniform, desirable chip product.

The immediately succeeding knife **120** is then presented to the wood stock positioned on the upper surface of the anvil **118** and the scissors action produced by the coaction of the knife **120** with the anvil **118** is effected by the engagement initially of the toe **170** of the cutting edge **186** of this immediately succeeding knife. On continued rotation of the chipper disk **122**, the follow-through of the heel **168** of the cutting edge **186** of the knife completes the scissors action. Thus it will be seen that the angle between the toe **170** of the cutting edge **186** of the immediately succeeding knife and the anvil line E is substantially the same as the angle between the heel **168** of the cutting edge **186** of the immediately preceding knife, the apex of the latter angle being the heel **168**, while the apex of the former angle is the toe **170**.

This sequence of angular position of the remaining knives is repeated so that, in effect, there is presented to the horizontal anvil in sequence alternately the heel and the toe of successive knives.

This advantageous arrangement insures substantial centering of the random sized wood stock on presentation to the cutting path of the chipper disk **122**. Thus while scissors action produced by a first knife tends to move the wood stock away from the cutting face **164**, the cutting action of the immediately succeeding knife tends to move the wood stock towards the cutting face **164** of the chipper disk, thus effectively, continuously centering the wood stock on its presentation thereto.

From the foregoing detailed description, it will be apparent that the present invention provides an improved chipper assemblage which besides being simple and exceedingly durable in construction, is highly efficient in use and provides a convenient means for reducing random size wood stock to an acceptable chip product which, heretofore, had been done, if at all, only with great difficulty when using conventional chipping assemblages. The knives, associated with the instant invention, besides being conveniently removable and insertible, are also readily adjustable so as to insure most effective functioning thereof, and the improved angular placement of the knives on the chipper disk, relative to each other and to the stationary horizontally positioned anvil surprisingly permits maximum utilization of the blades by substantially continuously maintaining the wood stock centered in its presentation to the cutting face of the chipper disk.

The knife blade assemblage moreover avoids obstructing chip discharge openings in the chipper disk thereby avoiding build up of chip product under the cutting edge of the knife. The entire structure will obviously insure most economical chipping operation on a wood stock heretofore reduced only with great difficulty and/or expense.

It should be understood that it is not desired to limit the invention to the exact details of construction or to the precise mode of use, herein shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

What is claimed is:

1. A wood chipper suitable for reducing discrete pieces of wood of random size to a chip comprising the combination of a feeding assembly and a chipping assembly, said feeding assembly comprising means to continuously feed said random size pieces of wood to said chipping assembly, pivotable doffing means in combination with said feed means to conduct said wood to the cutting path of said chipping assembly, means pivotably attached to said pivotable doffing means for engaging the upper surface of the wood thereby maintaining said wood proximate the cutting path of said chipping assembly, said chipping assembly comprising a rotary chipping disk and a horizontal stationary anvil disposed perpendicular to the plane of the rotary chipping disk, said chipping disk provided with a plurality of cutting knives, the cutting edge of each knife coacting with the stationary anvil to progressively propagate a scissors-like cut along a radius of said chipping disk, the direction of cut propagation of successive knives being opposite to the direction of cut propagation of an immediately preceding knife.

2. A wood chipper suitable for reducing discrete pieces of wood of random size to a chip comprising the combination of a feeding assembly and a chipping assembly, said feeding assembly comprising an elongated endless conveyor belt, said belt adapted to conduct random size pieces of wood to said chipping assembly, pivotable doff roll coacting with said conveyor belt to deliver said wood to the cutting path of said chipping assembly, a plurality of hold down fingers pivotably attached to said pivotable doff roll to engage the upper surface of the wood thereby maintaining said wood proximate the cutting path of said chipping assembly, said chipping assembly comprising a rotary chipping disk and a horizontal stationary anvil disposed perpendicular to the plane of the rotary chipping disk, said chipping disk provided with a plurality of elongated apertures extending substantially radially outwardly from adjacent the center of said chipping disk to the periphery thereof, an elongated knife assembly detachably secured to said disk surface directly behind each of said apertures, each knife coacting with the stationary anvil to progressively propagate a scissors-like cut along a radius of said chipping disk, the direction of cut propagation of successive knives being opposite to the direction of cut propagation of an immediately preceding knife.

3. A wood chipper suitable for reducing discrete pieces of wood of random size to a chip comprising the combination of a feeding assembly and a chipping assembly, said feeding assembly comprising, in combination, support means, means to deliver said discrete pieces of wood to said chipping assembly, means to actuate said delivery means, said chipping assembly comprising, in combination, an anvil, support means for said anvil, a rotary chipping disk, means for housing and supporting said rotary chipping disk and means for rotating said chipping disk, said chipping disk provided with a plurality of cutting knives, the cutting edge of each knife coacting with the stationary anvil to progressively propagate a scissors-like cut along a radius of said chipping disk, the direction of cut propagation of successive knives being opposite to the direction of cut propagation of the immediately preceding knife.

4. The wood chipper of claim **3** wherein said feeding assembly includes means for maintaining said wood pieces proximate the cutting path of said chipping disk.

5. A wood chipper suitable for reducing discrete pieces of wood of random size to a chip comprising the combination of a feeding assembly and a chipping assembly, said feeding assembly comprising a conveyor belt for continuously feeding said random size pieces of wood to said chipping assembly, pivotable vertically adjustable doffing means in combination with said conveyor belt adapted to conduct said wood to the cutting path of said chipping

assembly, a plurality of pivotable arcuately shaped hold down fingers operatively connected to said doffing means, the free end of each of said hold down fingers extending downwardly and forwardly and having a mass sufficient to maintain the random size pieces of wood proximate the cutting path of said chipping assembly, said chipping assembly comprising a rotary chipping disk and a horizontal stationary anvil disposed perpendicular to the plane of the rotary chipping disk, said chipping disk provided with a plurality of cutting knives extending substantially from adjacent the center of said cutting disk to adjacent the periphery thereof, the cutting edge of each knife coacting with the stationary anvil to progressively propagate a scissors-like cut along a radius of said chipping disk, the direction of cut propagation of successive knives being opposite to the direction of cut propagation of an immediately preceding knife.

6. The wood chipper of claim 5 including means for adjusting the angular position of the cutting knives relative to the leading edge of said anvil.

7. In a wood chipper of the type having a chipping assembly comprising a rotary chipping disk rotating in a vertical plane and a horizontal stationary anvil disposed perpendicular to the plane of the rotary chipping disk, said rotary disk having a plurality of cutting knives, the cutting edge of each knife coacting with the stationary anvil to progressively propagate a scissors-like cut along a radius of said chipping disk, the improvement comprising means to continuously feed random size pieces of wood to said chipping assembly, said means comprising a conveyor belt, pivotable vertically adjustable doffing means in combination with said conveyor belt adapted to conduct said wood to the cutting path of said chipping assembly and a plurality of pivotable, arcuately-shaped hold down fingers operatively connected to said doffing means, the free end of each of said hold down fingers extending downwardly and forwardly and having a mass sufficient to maintain the random size pieces of wood proximate the cutting path of said chipping assembly.

8. In a wood chipper of the type having a chipping assembly comprising a rotary chipping disk rotating in a vertical plane and a horizontal stationary anvil disposed perpendicular to the plane of the rotary chipping disk, the improvement comprising a plurality of cutting knives detachably mounted on said chipping disk, the cutting edge of each knife coacting with the stationary anvil to progressively propagate a scissors-like cut along a radius of said chipping disk, the direction of cut propagation of successive knives being opposite to the direction of cut propagation of an immediately preceding knife.

9. In a wood chipper of the type having a chipping assembly comprising a rotary chipping disk rotating in a vertical plane and a horizontal stationary anvil disposed perpendicular to the plane of the rotary chipping disk, the improvement comprising a plurality of cutting knives detachably mounted on the face of said chipping disk, each of said knives being inclined in relationship to said disk face and extending from adjacent the center of said disk to adjacent the periphery thereof, the cutting edge of each knife coacting with the stationary anvil to progressively propagate a scissors-like cut along a radius of said chipping disk, the direction of cut propagation of successive knives being opposite to the direction of cut propagation of an immediately preceding knife.

10. In a wood chipper of the type having a chipping assembly comprising a rotary chipping disk rotating in a vertical plane and a horizontal stationary anvil disposed perpendicular to the plane of the rotary chipping disk, the improvement comprising a plurality of cutting knives detachably mounted on one face of said chipping disk, each of said knives being inclined in relationship to said disk face and extending from adjacent the center of said disk to adjacent the periphery thereof, the cutting edge of each knife coacting with the stationary anvil to progressively propagate a scissors-like cut along a radius of said chipping disk, said cutting edge having a heel portion adjacent the center of said disk and a toe portion remote therefrom, the heel and toe portions of successive knives being initially presented to said anvil whereby the direction of cut propagation of successive knives is opposite to the direction of cut propagation of the immediately preceding knife.

11. In a wood chipper of the type having a chipping assembly comprising a rotary chipping disk rotating in a vertical plane and a horizontal stationary anvil disposed perpendicular to the plane of the rotary chipping disk, the improvement comprising a plurality of cutting knives detachably mounted on one face of said chipping disk, each of said knives being inclined in relationship to said disk face and extending from adjacent the center of said disk to adjacent the periphery thereof, the cutting edge of each knife coacting with the stationary anvil to progressively propagate a scissors-like cut along a radius of said chipping disk, said cutting edge having a heel portion adjacent the center of said disk and a toe portion remote therefrom, the heel and toe portions of successive knives being initially presented to said anvil whereby the direction of cut propagation of successive knives is opposite to the direction of cut propagation of the immediately preceding knife, and knife adjusting means remote from said cutting edge and parallel thereto for adjusting said knife at a predetermined angle.

12. In a wood chipper of the type having a chipping assembly comprising a rotary chipping disk rotating in a vertical plane and a horizontal stationary anvil disposed perpendicular to the plane of the rotary chipping disk, the improvement comprising a plurality of cutting knives detachably mounted on one face of said chipping disk, each of said knives being inclined in relationship to said disk face and extending from adjacent the center of said disk to adjacent the periphery thereof, the cutting edge of each knife coacting with the stationary anvil to progressively propagate a scissors-like cut along a radius of said chipping disk, said cutting edge having a heel portion adjacent the center of said disk and a toe portion remote therefrom, the heel and toe portions of successive knives being initially presented to said anvil whereby the direction of cut propagation of successive knives is opposite to the direction of cut propagation of the immediately preceding knife, knife adjusting means remote from said cutting edge and parallel thereto for adjusting said knife at a predetermined angle, and an elongated substantially radially extending slot provided in the cutting disk adjacent the cutting edge of each knife and extending substantially the length thereof.

13. A wood chipper suitable for reducing discrete pieces of wood of random size to a chip comprising the combination of a feeding assembly and a chipping assembly, said feeding assembly comprising a conveyor belt for continuously feeding said random size pieces of wood to said chipping assembly, pivotable vertically adjustable doffing means in combination with said conveyor belt adapted to conduct said wood to the cutting path of said chipping assembly, a plurality of pivotable hold down fingers operatively connected to said doffing means, the free end of each of said hold down fingers extending downwardly and forwardly and having a mass sufficient to maintain the random size pieces of wood proximate the cutting path of said chipping assembly, said chipping assembly comprising a rotary chipping disk and an adjustable horizontal stationary anvil disposed perpendicular to the plane of the rotary chipping disk, said chipping disk provided with a plurality of cutting knives detachably mounted on one face of said chipping disk, each of said knives being inclined in relationship to said disk face and extending from adjacent the center of said disk to adjacent the periphery thereof, the cutting edge of each knife coacting with the stationary anvil to progressively propagate a scissors-like cut along a radius

of said chipping disk, said cutting edge having a heel portion adjacent the center of said disk and a toe portion remote therefrom, the heel and toe portions of successive knives being initially presented to said anvil whereby the direction of cut propagation of successive knives is opposite to the direction of cut propagation of the immediately preceding knife and knife adjusting means remote from and parallel to the cutting edge for adjusting said knife at a predetermined angle.

14. The wood chipper of claim **13** including an elongated substantially radially extending slot provided in the cutting disk adjacent the cutting edge of each knife and extending substantially the length thereof.

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