Oct. 4, 1966 H. J. EKLUND 3,276,700

WOOD CHIPPER

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Fig. 1

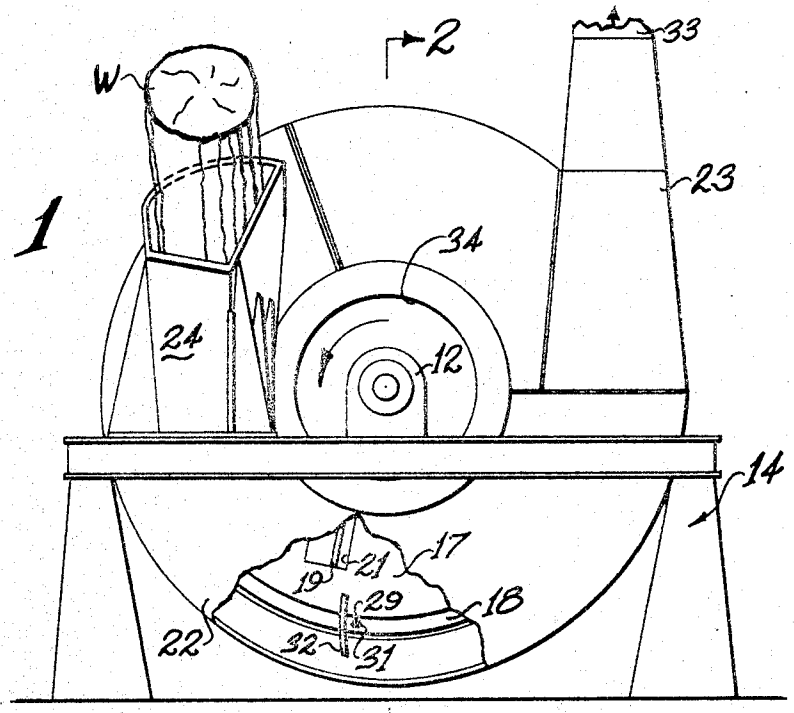
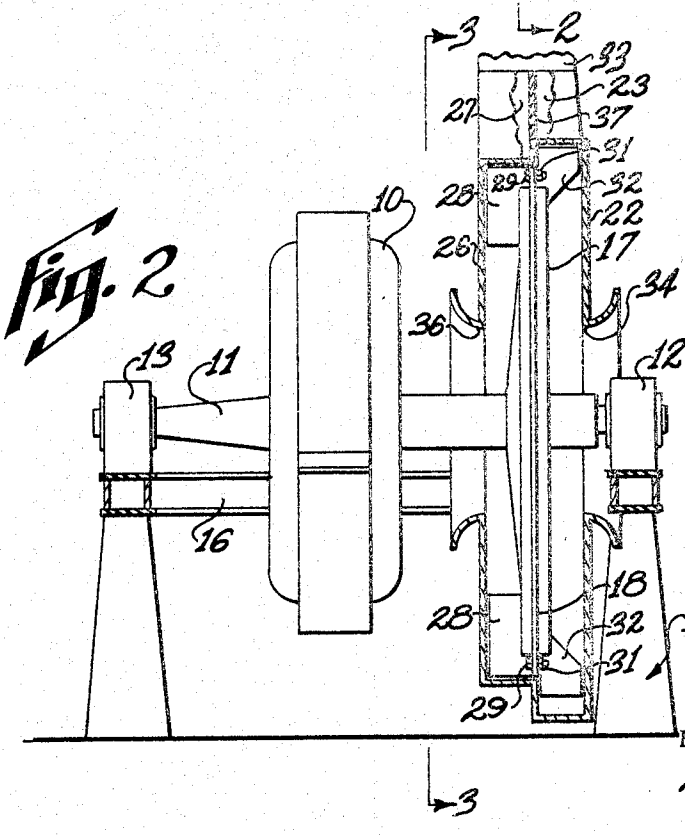


Fig. 2



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Fig. 3

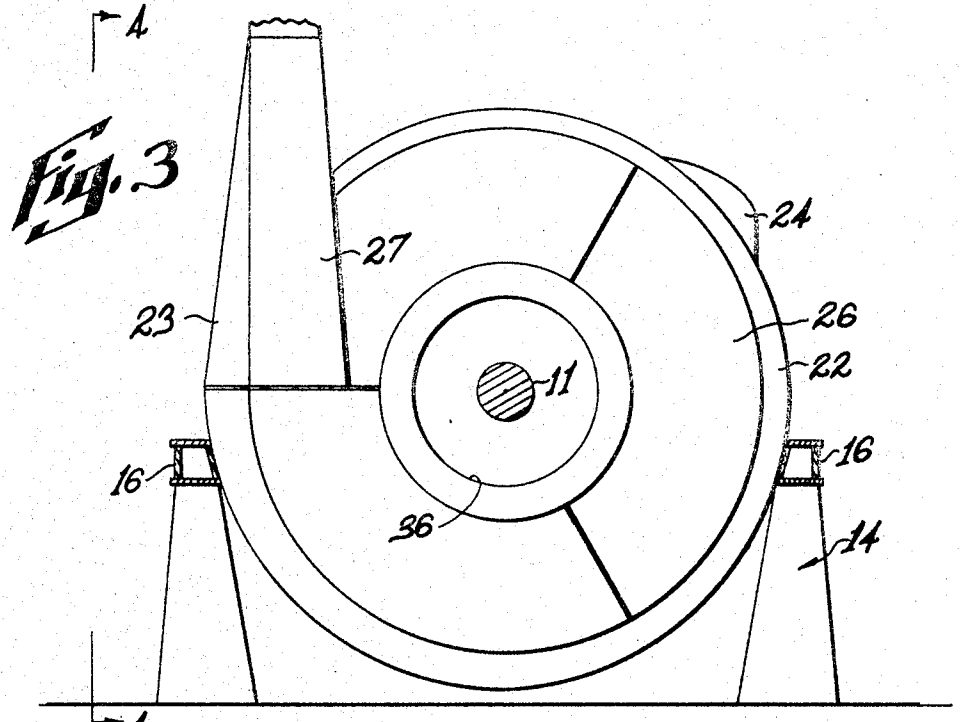
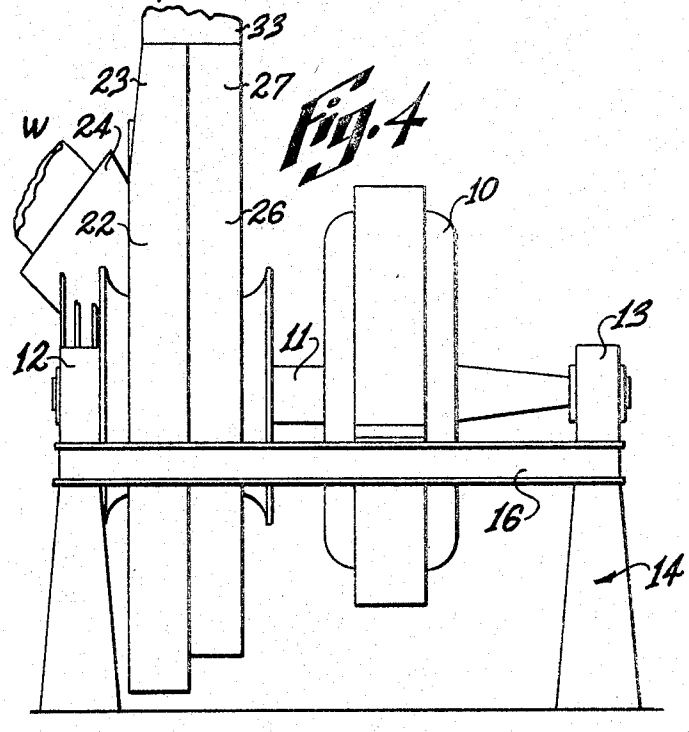


Fig. 4



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WOOD CHIPPER

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5 Claims. (Cl. 241—55)

This invention relates to a wood chipper and more particularly to improved means for continuously removing chips from the chipper as they are cut.

As object of my invention is to provide a wood chipper in which the chips are conveyed therethrough and discharged by a combination of forces consisting of the kinetic energy possessed by the moving chips, the blowing action of a moving stream of air adjacent the chips, and the blowing action of an involute blower.

Another object of my invention is to provide a wood chipper of the character designated in which the wood chips are discharged as fast as they are brought into the apparatus, thereby eliminating carry-over of the chips.

A further object of my invention is to provide a wood chipper of the character designated in which an effective blower is provided without the chips entering the space between the blowing means and the housing therefor.

A still further object of my invention is to provide a wood chipper which shall be simple of construction, economical of manufacture and one which is compact and requires a minimum of space for shipment, storage and installation.

Heretofore in the art to which my invention relates various types of wood chippers have been proposed. However, the chip conveying means for such chippers depend almost entirely upon the kinetic energy possessed by the moving chips. While some air is conveyed through conventional type wood chippers by radially extending blades therein, which contact the chips, the air is insufficient for effective removal of the chips for the reason that a relatively close clearance is required between the radially extending chip conveying blades and the housing therefor. That is, the chip conveying housing is not involute in shape since there would be a substantial distance between the chip conveying blades and the housing adjacent the discharge end thereof whereby the chips would enter the space between the blades and the housing.

To overcome the above and other difficulties, I provide a wood chipper embodying a rotary disc having angularly spaced knives and passageways therethrough, together with means to feed wood to one side of the disc whereby the wood is cut into chips which pass through the passageways to the other side of the disc. An involute blower housing surrounds the side of the rotary disc adjacent the wood feeding means and a circular chip receiving housing surrounds the other side of the disc. The circular chip receiving housing is separated from the involute housing by the disc whereby separate housings are provided at opposite sides of the disc. Angularly spaced blades are carried by opposite sides of the rotary disc whereby chips are continuously conveyed through the circular chip receiving housing and air is circulated continuously through the involute housing. The circular housing is provided with a tangential outlet and the involute housing is provided with a circumferential outlet, both of which communicate with a discharge conduit whereby the air discharged through the circumferential outlet aids in conveying the chips through the discharge conduit.

Apparatus embodying features of my invention is illustrated in the accompanying drawings, forming a part of this application, in which:

FIG. 1 is a side elevational view, partly broken away and in section;

FIG. 2 is a vertical sectional view taken generally along line 2—2 of FIG. 1;

FIG. 3 is a view taken generally along the line 3—3 of FIG. 2; and,

FIG. 4 is an end elevational view taken generally along the line 4—4 of FIG. 3.

Referring now to the drawings for a better understanding of my invention, I show a power unit **10**, such as an electric motor, having a drive shaft **11**. Opposite ends of the drive shaft **11** are supported in suitable bearing members **12** and **13** which in turn are supported by a supporting frame indicated generally at **14**. The power unit **10** is also connected to transverse frame members **16** which is turn are connected to the supporting frame **14**.

Mounted on the shaft **11** and adapted for rotation therewith is a rotary disc **17** having a peripheral flange **18**, as shown in FIGS. 1 and 2. A plurality of angularly spaced knives **19** are mounted at one side of the rotary disc **17** and angularly spaced through passageways **21** are provided adjacent the knives whereby wood cut into chips by the knives passes through the passageways to the opposite side of the disc.

Surrounding the side of the rotary disc **17** carrying the knives **19** is an involute housing **22** having a circumferential outlet **23**. A feed chute **24** communicates with the involute housing **22** in position to feed wood indicated at W to the adajacent side of the rotary disc **17** whereby the wood contacts the knives **19** and is cut into chips which pass through the openings **21** to the opposite side of the rotary disc. Surrounding the other side or discharge side of the rotary disc **17** is a circular, chip-receiving housing **26** having a tangential outlet **27**.

Secured to the rotary disc **17** in position to rotate within the circular housing **26** are a plurality of angularly spaced blades **28**. As shown in FIG. 2, the blades **28** are adapted to rotate within the circular housing **26** with a relatively close fit whereby chips are conveyed therethrough and then outwardly through the tangential outlet **27**. The blades **28** are secured in place by suitable means, such as bolts **29** having nuts **31**.

Secured to the rotary disc **17** in position to rotate within the involute housing **22** are a plurality of angularly spaced blades **32**. The blades **32** are preferably secured in place by the same bolts **29** which secure the blades **28** in place. That is, the bolts **29** pass through the blades **28**, the peripheral flange **18** and the blades **32**. Also, the blades **32** are positioned outwardly of the feed chute **24** whereby the wood does not contact the blades **32**. By providing an involute housing **22**, the blades **32** move progressively away from the inner surface of the housing **22** as they approach the circumferential outlet **23**. That is, the spacing between the blades **32** and the inner circumferential surface of the involute housing **22** increases from approximately ½ inch until it reaches approximately 7 inches adjacent the circumferential outlet **23**. Accordingly, the involute housing **22** having the fan blades **32** therein provides a very efficient blower which discharges air through the circumferential outlet **23**.

Communicating with the upper end of the circumferential outlet **23** and the upper end of the tangential outlet **27** is a discharge conduit **33**, whereby the air discharged from the circumferential outlet **23** aids in conveying the chips which are discharged through the tangential outlet **27**. As shown in FIG. 2, the outer wall of the circumferential outlet **23** is directed upwardly and inwardly toward the tangential outlet **27** whereby the air discharged therefrom strikes the chips at an angle to prevent channeling of the air.

From the foregoing description, the operation of my improved wood chipper will be readily understood. The wood W is fed into the chute **24** whereupon it is cut into chips by the knives **19**. The chips pass through the open-

ings 21 into the chip receiving housing 2. Since the blades 32 are mounted outwardly of the feed means 24, they do not contact the wood, but provide blower blades which circulate air through the involute housing 22. Air is drawn inwardly of the involute housing 22 by a centrally disposed inlet opening 34 which surrounds the drive shaft 11, as shown in FIG. 2. In like manner some air is drawn inwardly of the chip receiving housing 26 by a centrally disposed inlet opening 36 which also surrounds the shaft 11.

The chips are conveyed through the housing 26 by the kinetic energy possessed by the moving chips and the air drawn inwardly through the inlet opening 36. Since the housing 26 is circular, the blades 28 remain relatively close to the inner circumferential surface of the housing 26, thereby preventing the chips from entering the small space between the housing and the blades 28. As the chips are discharged from the tangential outlet 27, they are engaged by the air which is discharged through the circumferential outlet 23 whereby this air aids in conveying the chips through the discharge conduit 33. It will be noted that the circumferential outlet 23 is separated from the tangential outlet 27 by a partition wall 37 whereby the air discharged through the circumferential outlet 23 does not engage the chips until they are introduced into the discharge outlet 33.

From the foregoing, it will be seen that I have devised an improved wood chipper which is compact in construction and one which utilizes a self-contained blower in conjunction with the kinetic energy possessed by the moving chips to remove the chips continuously from the apparatus in an effective manner. By providing an involute blower housing at the opposite side of the rotary disc from the circular chip receiving housing, I not only provide an effective blower which aids in conveying the chips, but provide a chip receiving housing which is positioned relatively close to the chip conveying blades therein, thereby eliminating passage of the chips between the conveying blades and the housing. Furthermore, by providing an involute blower housing and a circular chip receiving housing at opposite sides of the rotary disc member which in turn is mounted on a common shaft with the drive means for the chipper, I not only reduce the overall size of the chipper but provide one which is dynamically balanced and one which requires a minimum of operating parts.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In a wood chipper embodying a rotary disc having angularly spaced knives and angularly spaced passageways therethrough together with means to feed wood to one side of the disc whereby the wood is cut into chips which pass through the passageways to the other side of the disc,

(a) an involute housing surrounding said one side of said disc,

(b) a circular housing surrounding said other side of the disc and separated from said involute housing by said disc,

(c) angularly spaced blades carried by said other side of the disc and disposed to rotate within said circular housing with a relatively close fit to convey chips therethrough,

(d) angularly spaced blades carried by said one side of the disc outwardly of said means to feed wood and disposed to rotate within said involute housing to circulate air therethrough,

(e) a tangential outlet for said circular housing for discharging chips therefrom,

(f) a circumferential outlet for said involute housing adjacent and alongside said tangential outlet for discharging air therefrom, and

(g) a discharge conduit communicating with said tangential outlet and said circumferential outlet to receive chips discharged through said tangential outlet and air discharged through said circumferential outlet whereby the air discharged through said circumferential outlet aids in conveying the chips through said discharge conduit.

2. A wood chipper as defined in claim 1 in which the disc is provided with an annular member around the periphery thereof in position to separate the outer portion of the involute housing from the outer portion of the circular housing.

3. A wood chipper as defined in claim 2 in which the radially extending blades are secured to said annular member.

4. A wood chipper as defined in claim 1 in which the circumferential outlet is defined by a conduit having its discharge end directed inwardly toward the tangential outlet whereby air discharged from said circumferential outlet contacts the chips discharged through said tangential outlet at an angle.

5. A wood chipper comprising:

(a) a drive shaft,

(b) bearing members supporting opposite ends of said shaft for rotation,

(c) a motor mounted on said shaft intermediate said bearing members for rotating the same,

(d) a disc mounted on said shaft intermediate said motor and one of said bearing members for rotation therewith and having angularly spaced passageways therethrough,

(e) angularly spaced knives carried by one side of said disc adjacent said passageways,

(f) means to feed wood to said one side of the disc whereby the wood is cut into chips which pass through the passageways to the other side of the disc,

(g) an involute housing surrounding said one side of said disc,

(h) a circular housing surrounding said other side of the disc and separated from said involute housing by said disc,

(i) angularly spaced blades carried by said other side of the disc and disposed to rotate within said circular housing with a relatively close fit to convey chips therethrough,

(j) angularly spaced blades carried by said one side of the disc outwardly of said means to feed wood and disposed to rotate within said involute housing to circulate air therethrough,

(k) a tangential outlet for said circular housing for discharging chips therefrom,

(l) a circumferential outlet for said involute housing adjacent and alongside said tangential outlet for discharging air therefrom, and

(m) a discharge conduit communicating with said tangential outlet and said circumferential outlet to receive chips discharged through said tangential outlet and air discharged through said circumferential outlet whereby the air discharged through said circumferential outlet aids in conveying the chips through said discharge conduit.

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