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(54) **BAND SAW HAVING POROUS BEARINGS AND A METHOD OF OPERATING A BAND SAW**
BANDSÄGE MIT PORÖSEN LAGERN UND VERFAHREN ZUM BETRIEB EINER BANDSÄGE
SCIE À RUBAN À PALIERS POREUX ET PROCÉDÉ DE FONCTIONNEMENT D'UNE SCIE À RUBAN

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## Description

Field of the Invention.

**[0001]** The present invention relates to an improvement in a band saw apparatus in which a location of a blade cutting section, an angle of the blade in relation to the cant being cut, and tension on the blade can be adjusted by moving first and second support arms having porous bearings.

Background of the Invention.

**[0002]** In the lumber industry, a number of apparatuses have been employed to cut timber (hereinafter referred to as a cant) into usable pieces for subsequent operations or usage. Frequently, a wood cant must be cut into fairly thin but elongated pieces and typically band saws are used to accomplish this operation. In conventional band saws, such as represented by U.S. Patent Nos. 4,061,066, issued December 6, 1977, 6,745,644, issued June 8, 2004, 5,557,989, issued September 24, 1996 and 5,819,613, issued October 13, 1998, an endless band saw is looped around an idler pulley wheel and a drive wheel which is motor driven and operated at high speed to rotate the drive wheel and, hence, the band saw over the pulley wheel while cants or wooden pieces are transported by a conveyor or manually against the cutting teeth of the band saw. Tension on the band saw is maintained by adjusting the distance between the central axis of rotation of the pulley and the drive wheel. The maintenance of the proper tension in the band saw loop is critical to efficient cutting operation and the avoidance of damage to the band saw loop. In particular, an improper low tension will result in wastage of the wood product since vibration of the loop will increase the size of the kerfs or cut made in the wood and can lead to breakage of the band itself.

**[0003]** My earlier U.S. Patent No. 8,151,680 (Pollard) discloses an air bearing being use in a band saw. Different sized bearings are used to provide different locations for the cutting sections of the band saw.

**[0004]** US3465794 discloses a band saw as per the preamble of appended claim 1 and a method of using such a band saw.

Summary of the Invention.

**[0005]** An objective of the invention is to provide an improved band saw.

**[0006]** In the band saw according to the present invention and according to US3465794, the rotatable idler pulley is eliminated and replaced by first and second low friction guide members (support arms) that have porous media bearings for individual band saw loops. The drive wheel can be formed with a corresponding number of tracks to enhance guidance of the band saw or saws. In addition, the drive wheel may be provided with sprocket teeth on the track surfaces to cooperate with sprocket openings formed along one edge of the band saw opposite the edge on which the cutting teeth are formed. The band saw blade is floated off of the porous media bearings by a lubricant under pressure.

**[0007]** An advantage of the present invention is that the location of the cutting section of the blade can be adjusted by moving the first and second support arms in the horizontal direction or plane. The tension on the blade can be adjusted by moving the first and second support arms in opposing directions in the vertical direction or plane. The angle of the blade can be adjusted by moving the first and second support arms in opposing directions in the horizontal direction or plane.

**[0008]** In a preferred embodiment, centering of the blade on the support arms can be adjusted by adjusting the tilt of the first and second support arms in relation to the drive wheel. The same size blades (i.e. having the same overall length) can be utilized and the location of the cutting section of the blade can be easily be adjusted without having to utilize different size drive wheels. Thus, the claimed invention saves significant cost by being able to utilize one size blade and one size drive wheel. Furthermore, the same size and shape bearing surfaces and support arms can be used. The adjustments to the blade cutting location, angle of cut, tension and centering can be conducted in real time to provide precise, multiple, simultaneous cuts in the cant.

**[0009]** The above objectives and other objectives can be obtained by a saw configured to cut cant comprising at least one band saw comprising:

a motor;
at least one drive wheel constructed to be driven by the motor;
at least one first support arm comprising a first porous media bearing;
at least one second support arm comprising a second porous media bearing;
at least one first locking structure connecting the first support arm to the support, the first locking structure constructed to move the first support arm in a horizontal direction and a vertical direction when unlocked and lock the first support arm in a desired position when locked;
at least one second locking structure connecting the second support arm to the support, the second locking structure constructed to move the second support arm in the horizontal direction and the vertical direction when unlocked and lock the second support arm in a desired position when locked; and
at least one continuous loop band saw blade supported by the drive wheel, the first support arm and the second support arm, wherein a cutting section of the band saw blade being defined between the first and second support arms, the cutting section being where cant is cut by the band saw blade, the first porous media bearing having a curved surface

for changing a direction of the band saw blade during use, the second porous media bearing having a curved surface for changing a direction of the band saw blade during use, a location of the cutting section can be adjusted by moving the first and second support arms in the horizontal direction, and a tension on the band saw blade can be adjusted by moving the first and second support arms in opposing directions in the vertical direction so that the tension can be increased by moving the first and second support arms to be farther apart and the tension can be decreased by moving the first and second support arms closer together.

**[0010]** The above objectives and other objectives can be obtained by a method of using the band saw according to claim 1 to cut cant comprising:

supplying pressurized lubricant to the first and second porous media bearings; and
conveying cant on the conveyor, and
operating the at least one band saw to cut the cant.

**[0011]** The foregoing and other advantages will become apparent as consideration is given to the follow detailed description taken in conjunction with the accompanying drawings, in which:

Brief Description of the Drawings.

**[0012]**

Fig 1 illustrates a top view of exemplary band saws 1 according to the present invention.

Fig. 2 illustrates a side view of exemplary band saws 1 according to the present invention.

Fig. 3 illustrates a support arm.

Fig. 4 illustrates a support arm.

Fig. 5 illustrates the use of a plurality of band saws 1 in a method according to the present invention.

Detailed Description of the Invention.

**[0013]** The inventions will now be explained with reference to the attached non-limiting drawings. Referring to Figs. 1-5, wherein like numerals designate corresponding parts throughout the several views, a pair of opposing band saws 1 constructed to cut cant 50 travelling on a conveyor 40. Each band saw 1 comprises a support 2, a motor 4 mounted on the support 2, a motor pulley 6 driven by the motor 4, a drive wheel pulley 8 connected to the motor pulley 6 by a belt 5, the drive wheel pulley 8 being mounted to a drive wheel axle 9, a drive wheel 10 being mounted to the drive wheel axle 9, a first support arm 12, a second support arm 13, a first locking structure 15 connecting the first support arm 12 to the support 2, a second locking structure 16 connecting the second support arm 13 to the support 2, and a band saw blade 20 supported by the drive wheel 10, the first support arm 12 and second support arm 13. While first and second support arms 12 and 13 are shown, more than two support arms may be utilized as shown in Fig. 5, and each additional support arm can have an associated locking structure. More than two support arms 12 and 13 can also be utilized in the same saw 1 as desired. Any number of saws 1 can be utilized, with two opposing saws 1 being preferred. The first support arm 12 comprises a first porous media bearing 17. The second support arm 13 comprises a second porous media bearing 18. The porous media bearings 17 and 18 are connected to a source of lubricant 32 so that during use pressure can be applied to lubricant 30 so that the lubricant 30 flows through the porous media bearings 17 and 18 to provide a layer of lubricant 30 between the band saw blade 20 and the porous media bearings 17 and 18. The lubricant 30 can comprise compressed air or gas and/or a fluid, from a source of lubricant 32. The amount of pressure used for the lubricant 30 can depend on the weight of the band saw blade 20 and the tension under which the band saw blade 20 is operating as will be apparent to those skilled in this technology.

**[0014]** The porous media bearing 17 can be any suitable structure that allows the lubricant 30 to pass through the porous media bearing 17 and form a layer of lubricant 30 between the band saw blade 20 and the surface of the porous media bearing 17. Examples of suitable porous media bearings are commercially available at www.newwavairbearings.com, www.ibspe.com, and www.nelsonair.com.

**[0015]** A preferred porous media bearing 17 is formed from carbon, and more preferably, graphite. Porous carbon is one of the best materials for this purpose, producing an ideal supply of uniform air pressure across the face of the bearing while automatically restricting and damping the air flow at the same time. The carbon surface also provides greater bearing protection if there is an air supply failure, and allows the bearings to be moved during air failure without damaging the support surface. While not preferred, the bearing 17 can be created using orifices, if desired, as shown in my previous U.S. Patent No. 8,151,680.

**[0016]** Precisely sized orifices can be formed on the bearing and combined with grooves to distribute the pressurized lubricant 30 evenly across the bearing face. However, if the bearing face becomes scratched across a groove or near an orifice, the volume of lubricant 30 that escapes may be more than the orifice can supply, causing the bearing to crash even with a normal supply pressure. Rather than the small number of orifices of conventional air bearings, porous media bearings control the airflow across the entire bearing surface through numerous, such as millions of, holes in the porous material.

Because of this, porous media bearings are harder to clog and will still fly even after being severely scratched.

**[0017]** The first locking structure 15 is constructed to move the first support arm 12 in the horizontal 25 direction or plane and move the first support arm 12 in the vertical 26 direction or plane. The first locking structure 15 can also tilt 27 the first support arm 12 in relation to the drive wheel 10. The second locking structure 16 is constructed to move the second support arm 13 in the horizontal 25 direction or plane and move the second support arm 13 in the vertical 26 direction or plane. The second locking structure can also tilt 27 the second support arm 13 in relation to the drive wheel 10. The horizontal 25 direction or plane can be perpendicular to the vertical 26 direction or plane

**[0018]** The location of the cutting section 21 of the blade 20 can be adjusted by moving the first and second support arms 12, 13 in the horizontal 25 direction or plane. Thus, when using multiple blades 20, the location of the cutting section 21 of each blade can adjusted to provide multiple simultaneous cuts in the cant, as shown in Fig. 5.

**[0019]** The angle of the blade 20 in the cutting section 21 can be adjusted by moving the first and second support arms 12, 13 in the horizontal 25 direction or plane in opposing directions to each other. Thus, the angle of the blade 20 in the cutting section 21 can be perpendicular to the horizontal 25 direction or plane, or adjusted to be any desired angle.

**[0020]** The tension on the blade 20 can be adjusted by moving the first and second support arms 12, 13 in opposing directions, for example in the vertical 26 direction or plane. The tension on the blade 20 can be increased by moving the first and second support arms 12, 13 away from each other and the tension can be decreased by moving the first and second support arms 12, 13 closer to each other.

**[0021]** Centering of the blade 20 on the support arms 12, 13 can be adjusted by adjusting the tilt 27 of the first and second support arms 12, 13 in relation to the drive wheel 10. Center of band saw blades 20 is now well known and any centering method can be utilized, such as angled surfaces and/or tilting of the support arms 12, 13. The tilt 27 can be in any desired direction to effect centering of the blade 20 on the bearings 17, 18.

**[0022]** The parts of the saw 1 can be formed of any suitable material, such as metals, composites, and polymers.

**[0023]** Being able to move the first and second support arms 12, 13 in relation to each other in both horizontal 25 and vertical 26 directions or planes greatly simplifies the required number of parts and cost. The same size drive wheels 10, band saw blades 20, and first and second support arms 12, 13 can be utilized to provide multiples cuts in different locations on the cant. Furthermore, the saw 1 can be easily be adjusted to provide more or less cuts in the cant. The location of the cuts into the cant 50 can be adjusted by moving the first and second support arms 12, 13 in the horizontal 25 direction or plane and the tension on the band saw blade 20 can be adjusted by moving the first and second support arms 12, 13 in opposing directions in the vertical 26 direction or plane. The horizontal 25 and vertical 26 directions or planes are shown in Fig. 5 in relation to the conveyor 40 conveying the cant. However, the horizontal 25 and vertical 26 directions or planes can be as desired. The horizontal 25 and vertical 26 directions or planes are preferably perpendicular to each other, but can be any angle as desired. The terms direction and plane have their common meanings. The term direction as used in the claims includes the term plane, i.e. when the movement of two support arms are in the same direction and also on the same level, the two movements are also in the same plane.

**[0024]** Preferably, each band saw 1 comprises a plurality of band saw blades 20 so that multiple cuts in the cant 50 can be performed at the same time, as shown in Fig. 5.

**[0025]** Each band saw blade 20 has associated first and second support arms 12, 13 and drive wheel 10 so that the plurality band saw blades 20 can be set in different positions in relation to each other, for example in the blades 20 can be spaced out from each other in the horizontal 25 direction or plane. The band saw blades 20 are continuous loops and any suitable conventional band saw blade can be utilized in the present invention.

**[0026]** The first and second locking structures 15, 16, each include an associated horizontal positioner 28 and a vertical positioner 29. The horizontal and vertical positioners 28 and 29 can comprise hydraulic cylinders, ball screw, electric motors, or any other suitable type of actuator. Positioners 28, 29 are now well known in the art and any suitable positioner 28, 29 can be utilized to move the support arms 12, 13.

**[0027]** A computer control system 60 comprising at least one cant detector is in communication with the band saw. The system 60 controls operation of the band saw including individual control of each horizontal positioner 28 and each vertical positioner 29. An example of a cant detector is a laser scanner constructed to measure the dimensions and location of the cant 50 approaching the band saw. The measurements taken by the to cant detector can be used by the computer control system 60 to determine how to form the most boards from the cant 50, move the cant 50 onto the conveyor 40 in the correct position for cutting, and to move the cutting sections 21 into the correct positions for making the cuts. Computer systems 60 are now well known and any suitable computer system can be utilized.

**[0028]** To effect cutting, the cant 50 travelling on a conveyor 40 can be fed against a cutting edge of the band saw blade(s) 20 in the cutting section(s) 21. During operation, a lubricant 30 comprising compressed gas and/or a fluid, from a source of lubricant 32 can be sent through the porous media bearings 17, 18 to float the band saw blade 20 off of the porous media bearings 17 and 18.

**[0029]** If desired, cuts in the cant 50 can be conducted between the drive wheel 10 and a support arm 12 or 13.

**[0030]** The invention is not limited to the specific examples shown in the drawings. A main teaching of the present invention is that at least two support arms each having a porous media bearing are configured to move in at least to directions so that the location of the cuts into the cants can be moved by moving the at least two support arms in a same direction and tension on the blade can adjusted by moving the at least two support arms towards/away from each other, so that same size blades can be utilized to provide different cut locations in the cant. Prior art methods require different size blades to provide different cut locations in the cant. Furthermore, the present invention is capable of providing precise adjustments to the cut location in the cant and the angle of the cut in the cant in real time. Any number of support arms can be utilized as desired.

**[0031]** While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the scope of the appended claims.

## Claims

**1.** A saw configured to cut cant comprising at least one band saw (1) comprising:

a motor (4);
at least one drive wheel (10) configured to be driven by the motor;
at least one first support arm (12) comprising a first porous media bearing (17);
at least one second support arm (13) comprising a second porous media bearing (18);
at least one first locking structure (15) connecting the first support arm (12) to a support (2), the first locking structure constructed to move the first support arm in a vertical direction when unlocked and lock the first support arm in a desired position when locked;
at least one second locking structure (16) connecting the second support arm (13) to the support (2); and
at least one continuous loop band saw blade (20) supported by the drive wheel (10), the first support arm (12) and the second support arm (13), wherein a cutting section (21) of the band saw blade (20) being defined between the first and second support arms, the cutting section being where cant is cut by the band saw blade, the first porous media bearing (17) having a curved surface for changing a direction of the band saw blade during use, the second porous media bearing (18) having a curved surface for changing a direction of the band saw blade during use, a tension on the band saw blade can be adjusted by moving the first support arm (12) in the vertical direction,
**characterized in that**:

the first locking structure (15) is further constructed to move the first support arm (12) in a horizontal direction;
the second locking structure (16) is constructed to move the second support arm (13) in the horizontal direction and the vertical direction when unlocked and lock the second support arm in a desired position when locked;
a location of the cutting section (21) can be adjusted by moving the first and second support arms in the horizontal direction;
and the tension on the band saw blade (20) can be adjusted by moving the first and second support arms in opposing directions in the vertical direction
so that the tension can be increased by moving the first and second support arms to be farther apart and the tension can be decreased by moving the first and second support arms closer together.

**2.** The saw according to claim 1, wherein an angle of the band saw blade (20) in relation to the cant being cut can be adjusted by moving the first and second arms in relation to each other.

**3.** The saw according to claim 1, wherein the first locking structure (15) is constructed to tilt the first support arm (12) in relation to the drive wheel (10) to allow centering of the band saw blade (20) on the first porous media bearing (17) and the second locking structure (16) is constructed to tilt the second support arm (13) in relation to the drive wheel to allow centering of the band saw blade on the second porous media bearing (18).

**4.** The saw according to claim 1, further comprising a plurality of the band saw blades, each band saw blade (20) being supported by an associated drive wheel (10) and first and second support arms (12, 13).

**5.** The saw according to claim 4, wherein a first band saw blade and a second band saw blade are the same size, the first band saw blade has a first cutting section, the second band saw blade has a second cutting section, and the first cutting section being in a different location than the second cutting section.

**6.** The saw according to claim 1, further comprising a computer system (60) in communication with the first and second locking structures, the computer system

being configured to independently control movements of the first and second support arms (12, 13) in the horizontal and vertical directions.

**7.** The saw according to claim 1, further comprising a source of lubricant (32) connected to the first porous media bearing surface and to the second porous media bearing surface so that during use the band saw blade (20) floats on a layer of lubricant between the first porous media bearing (17) and the band saw blade and a layer of lubricant between the second porous media bearing (18) and the band saw blade.

**8.** The saw according to claim 7, wherein the source of lubricant (32) comprises compressed air or oil.

**9.** The saw according to claim 1, comprising opposing first and second band saws.

**10.** The saw according to claim 1, wherein the first locking structure (15) comprises a first horizontal positioner (28) and a first vertical positioner (29), and the second locking structure (16) comprises a second horizontal positioner (28) and a second vertical positioner (29).

**11.** The saw according to claim 10, wherein the first and second horizontal positioners (28) and the first and second vertical positioners (29) each comprise at least one of hydraulic cylinders, ball screws, or electric motors.

**12.** A method of using a band saw (1) to cut cant (50) comprising:

providing at least one band saw (1) according to claim 1;
supplying pressurized lubricant to the first and second porous media bearings (17, 18); and
conveying cant on a conveyor (40), and
operating the at least one band saw to cut the cant.

**13.** The method according to claim 12, further comprising providing a plurality of band saws in which the cutting sections (21) of each band saw are spaced apart, and operating the conveyor (40) to provide multiple simultaneous cuts in the cant.

**14.** The method according to claim 13, wherein the plurality of band saws have a same size.

**15.** The method according to claim 12, further comprising moving the first and second support arms (12, 13) in opposing directions in the vertical direction to adjust the tension on the band saw blade.

**16.** The method according to claim 12, further comprising moving the first and second support arms (12, 13) in opposing directions in the horizontal direction to adjust an angle of the band saw blade in the cutting section (21).

**17.** The method according to claim 12, further comprising moving the first and second support arms (12, 13) in the horizontal direction to move the location of the cutting section (21).

**Patentansprüche**

**1.** Säge, die dazu konfiguriert ist, eine Kante zu schneiden, umfassend zumindest eine Bandsäge (1), umfassend:

einen Motor (4);
zumindest ein Antriebsrad (10), das dazu konfiguriert ist, durch den Motor angetrieben zu werden;
zumindest einen ersten Haltearm (12), umfassend ein erstes poröses Medienlager (17);
zumindest einen zweiten Haltearm (13), umfassend ein zweites poröses Medienlager (18);
zumindest eine erste Verriegelungsstruktur (15), die den ersten Haltearm (12) mit einer Halterung (2) verbindet,
wobei die erste Verriegelungsstruktur dazu ausgelegt ist, den ersten Haltearm in einer vertikalen Richtung zu bewegen, wenn sie entriegelt ist, und den ersten Haltearm in einer gewünschten Position zu verriegeln, wenn sie verriegelt ist;
zumindest eine zweite Verriegelungsstruktur (16), die den zweiten Haltearm (13) mit der Halterung (2) verbindet; und
zumindest ein kontinuierliches Schleifenbandsägeblatt (20), das von dem Antriebsrad (10), dem ersten Haltearm (12) und dem zweiten Haltearm (13) gehalten wird,
wobei ein Schneidabschnitt (21) des Bandsägeblatts (20) zwischen den ersten und zweiten Haltearmen definiert ist, wobei der Schneidabschnitt dort ist, wo eine Kante durch das Bandsägeblatt geschnitten wird, wobei das erste poröse Medienlager (17) eine gekrümmte Oberfläche aufweist zum Verändern einer Richtung des Bandsägeblatts im Betrieb, wobei das zweite poröse Medienlager (18) eine gekrümmte Oberfläche aufweist zum Verändern einer Richtung des Bandsägeblatts im Betrieb, wobei eine Spannung an dem Bandsägeblatt angepasst werden kann durch ein Bewegen des ersten Haltearms (12) in der vertikalen Richtung,
**dadurch gekennzeichnet, dass**:

die erste Verriegelungsstruktur (15) ferner

dazu ausgelegt ist, den ersten Haltearm (12) in einer horizontalen Richtung zu bewegen;
die zweite Verriegelungsstruktur (16) dazu ausgelegt ist, den zweiten Haltearm (12) in der horizontalen Richtung und in der vertikalen Richtung zu bewegen, wenn sie entriegelt ist, und den zweiten Haltearm in einer gewünschten Position zu verriegeln, wenn sie verriegelt ist;
ein Ort des Schneidabschnitts (21) angepasst werden kann durch ein Bewegen der ersten und zweiten Haltearme in der horizontalen Richtung; und
dass die Spannung an dem Bandsägeblatt (20) angepasst werden kann durch ein Bewegen der ersten und zweiten Haltearme in entgegengesetzte Richtungen in der vertikalen Richtung, derart, dass die Spannung erhöht werden kann durch ein derartiges Bewegen der ersten und zweiten Haltearme, dass sie ferner beabstandet voneinander sind, und dass die Spannung verringert werden kann durch ein derartiges Bewegen der ersten und zweiten Haltearme, dass sie näher beieinander sind.

**2.** Säge nach Anspruch 1, wobei ein Winkel des Bandsägeblatts (20) im Verhältnis zu der zu schneidenden Kante angepasst werden kann durch ein Bewegen der ersten und zweiten Arme im Verhältnis zueinander.

**3.** Säge nach Anspruch 1, wobei die erste Verriegelungsstruktur (15) dazu ausgelegt ist, den ersten Haltearm (12) im Verhältnis zu dem Antriebsrad (10) zu neigen, um ein Zentrieren des Bandsägeblatts (20) auf dem ersten porösen Medienlager (17) zu erlauben, und wobei die zweite Verriegelungsstruktur (16) dazu ausgelegt ist, den zweiten Haltearm (13) im Verhältnis zu dem Antriebsrad zu neigen, um ein Zentrieren des Bandsägeblatts auf dem zweiten porösen Medienlager (18) zu erlauben.

**4.** Säge nach Anspruch 1, ferner umfassend eine Mehrzahl der Bandsägeblätter, wobei jedes Bandsägeblatt (20) durch ein zugehöriges Antriebsrad (10) und erste und zweite Haltearme (12, 13) gehalten wird.

**5.** Säge nach Anspruch 4, wobei ein erstes Bandsägeblatt und ein zweites Bandsägeblatt die gleiche Größe aufweisen, wobei das erste Bandsägeblatt einen ersten Schneidabschnitt aufweist, wobei das zweite Bandsägeblatt einen zweiten Schneidabschnitt aufweist, und wobei der erste Schneidabschnitt an einem anderen Ort ist als der zweite Schneidabschnitt.

**6.** Säge nach Anspruch 1, ferner umfassend ein Computersystem (60), das in Verbindung mit den ersten und zweiten Verriegelungsstrukturen steht, wobei das Computersystem dazu konfiguriert ist, Bewegungen der ersten und zweiten Haltearme (12, 13) in den horizontalen und vertikalen Richtungen unabhängig zu steuern.

**7.** Säge nach Anspruch 1, ferner umfassend eine Schmierstoffquelle (32), die mit der Oberfläche des ersten porösen Medienlagers und mit der Oberfläche des zweiten porösen Medienlagers verbunden ist, derart, dass während der Verwendung das Bandsägeblatt (20) auf einer Schicht aus Schmierstoff zwischen dem ersten porösen Medienlager (17) und dem Bandsägeblatt und einer Schicht aus Schmierstoff zwischen dem zweiten porösen Medienlager (18) und dem Bandsägeblatt gleitet.

**8.** Säge nach Anspruch 7, wobei die Schmierstoffquelle (32) komprimierte Luft oder Öl umfasst.

**9.** Säge nach Anspruch 1, umfassend gegenüberliegende erste und zweite Bandsägen.

**10.** Säge nach Anspruch 1, wobei die erste Verriegelungsstruktur (15) ein erstes horizontales Positionierungsmittel (28) und ein erstes vertikales Positionierungsmittel (29) umfasst, und wobei die zweite Verriegelungsstruktur (16) ein zweites horizontales Positionierungsmittel (28) und ein zweites vertikales Positionierungsmittel (29) umfasst.

**11.** Säge nach Anspruch 10, wobei die ersten und zweiten horizontalen Positionierungsmittel (28) und die ersten und zweiten vertikalen Positionierungsmittel (29) jeweils zumindest eines von hydraulischen Zylindern, Kugelrollspindeln oder elektrischen Motoren umfassen.

**12.** Verfahren zum Verwenden einer Bandsäge (1) zum Schneiden einer Kante (50), umfassend:

Bereitstellen von zumindest einer Bandsäge (1) nach Anspruch 1;
Zuführen von druckbeaufschlagtem Schmierstoff zu den ersten und zweiten porösen Medienlagern (17, 18); und
Fördern von Kanten auf einem Fördermittel (40), und
Betreiben der zumindest einen Bandsäge zum Schneiden der Kante.

**13.** Verfahren nach Anspruch 12, ferner umfassend Bereitstellen von einer Mehrzahl von Bandsägen, in denen die Schneidabschnitte (21) von jeder Bandsäge voneinander beabstandet sind, und
Betreiben des Fördermittels (40) zum Vorsehen von mehreren simultanen Schnitten in der Kante.

**14.** Verfahren nach Anspruch 13, wobei die Mehrzahl von Bandsägen eine gleiche Größe aufweisen.

**15.** Verfahren nach Anspruch 12, ferner umfassend Bewegen der ersten und zweiten Haltearme (12, 13) in entgegengesetzte Richtungen in der vertikalen Richtung zum Anpassen der Spannung an den Bandsägeblättern.

**16.** Verfahren nach Anspruch 12, ferner umfassend Bewegen der ersten und zweiten Haltearme (12, 13) in entgegengesetzte Richtungen in der horizontalen Richtung zum Anpassen eines Winkels des Bandsägeblatts in dem Schneidabschnitt (21).

**17.** Verfahren nach Anspruch 12, ferner umfassend Bewegen der ersten und zweiten Haltearme (12, 13) in der horizontalen Richtung zum Bewegen des Ortes des Schneidabschnitts (21).

**Revendications**

**1.** Une scie configurée pour couper des pièces de bois, comprenant au moins une scie à ruban (1), comprenant :

un moteur (4) ;
au moins une roue d'entraînement (10) configurée pour être entraînée par le moteur ;
au moins un premier bras de support (12) comprenant un premier support (17) de media poreux ;
au moins un deuxième bras de support (13) comprenant un deuxième support (18) de media poreux ;
au moins une première structure de verrouillage (15) reliant le premier bras de support (12) à un support (2),
la première structure de verrouillage étant conçue pour déplacer le premier bras de support dans une direction verticale lorsqu'elle est déverrouillée et pour verrouiller le premier bras de support dans une position souhaitée lorsqu'elle est verrouillée ;
au moins une deuxième structure de verrouillage (16) reliant le deuxième bras de support (13) au support (2) ; et
au moins une lame (20) de scie à ruban à boucle continue supportée par la roue d'entraînement (10), le premier bras de support (12) et le deuxième bras de support (13),
une section de coupe (21) de la lame (20) de scie à ruban étant définie entre les premier et deuxième bras de support, la section de coupe étant là où la pièce de bois est coupée par la lame de scie à ruban, le premier support (17) de media poreux ayant une surface incurvée pour changer une direction de la lame de scie à ruban pendant l'utilisation, le deuxième support (18) de media poreux ayant une surface incurvée pour changer une direction de la lame de scie à ruban pendant l'utilisation,
une tension sur la lame de scie à ruban étant apte à être réglée en déplaçant le premier bras de support (12) dans la direction verticale,
**caractérisée en ce que** :

la première structure de verrouillage (15) est en outre conçue pour déplacer le premier bras de support (12) dans une direction horizontale ;
la deuxième structure de verrouillage (16) est conçue pour déplacer le deuxième bras de support (13) dans la direction horizontale et la direction verticale lorsqu'elle est déverrouillée et pour verrouiller le deuxième bras de support dans une position souhaitée lorsqu'elle est verrouillée ;
un emplacement de la section de coupe (21) est apte à être réglé en déplaçant les premier et deuxième bras de support dans la direction horizontale ;
et la tension sur la lame (20) de scie à ruban peut être réglée en déplaçant les premier et deuxième bras de support dans des directions opposées selon la direction verticale de sorte que la tension peut être augmentée en déplaçant les premier et deuxième bras de support de façon à être plus éloignés et la tension peut être réduite en rapprochant les premier et deuxième bras de support l'un de l'autre.

**2.** La scie selon la revendication 1, dans laquelle un angle de la lame (20) de scie à ruban par rapport à la pièce de bois à couper est apte à être réglé en déplaçant les premier et deuxième bras l'un par rapport à l'autre.

**3.** La scie selon la revendication 1, dans laquelle la première structure de verrouillage (15) est conçue pour incliner le premier bras de support (12) par rapport à la roue d'entraînement (10) afin de permettre le centrage de la lame (20) de scie à ruban sur le premier support (17) de media poreux, et la deuxième structure de verrouillage (16) est conçue pour incliner le deuxième bras de support (13) par rapport à la roue d'entraînement afin de permettre le centrage de la lame de scie à ruban sur le deuxième support (18) de media poreux.

**4.** La scie selon la revendication 1, comprenant en outre une pluralité de lames de scie à ruban, chaque lame (20) de scie à ruban étant supportée par une roue d'entraînement (10) associée et des premier et

deuxième bras de support (12, 13).

**5.** La scie selon la revendication 4, dans laquelle une première lame de scie à ruban et une deuxième lame de scie à ruban ont la même taille, la première lame de scie à ruban a une première section de coupe, la deuxième lame de scie à ruban a une deuxième section de coupe, et la première section de coupe étant à un emplacement différent de la deuxième section de coupe.

**6.** La scie selon la revendication 1, comprenant en outre un système informatique (60) en communication avec les première et deuxième structures de verrouillage, le système informatique étant configuré pour contrôler indépendamment les mouvements des premier et deuxième bras de support (12, 13) dans les directions horizontale et verticale.

**7.** La scie selon la revendication 1, comprenant en outre une source de lubrifiant (32) reliée à la première surface de support de media poreux et à la deuxième surface de support de media poreux de sorte qu'en cours d'utilisation, la lame (20) de scie à ruban flotte sur une couche de lubrifiant entre le premier support (17) de media poreux et la lame de scie à ruban et sur une couche de lubrifiant entre le deuxième support (18) de media poreux et la lame de scie à ruban.

**8.** La scie selon la revendication 7, dans laquelle la source de lubrifiant (32) comprend de l'air comprimé ou de l'huile.

**9.** La scie selon la revendication 1, comprenant des première et deuxième scies à ruban opposées.

**10.** La scie selon la revendication 1, dans laquelle la première structure de verrouillage (15) comprend un premier positionneur horizontal (28) et un premier positionneur vertical (29), et la deuxième structure de verrouillage (16) comprend un deuxième positionneur horizontal (28) et un deuxième positionneur vertical (29).

**11.** La scie selon la revendication 10, dans laquelle les premier et deuxième positionneurs horizontaux (28) et les premier et deuxième positionneurs verticaux (29) comprennent chacun au moins un parmi des vérins hydrauliques, des vis à billes ou des moteurs électriques.

**12.** Un procédé d'utilisation d'une scie à ruban (1) pour couper des pièces de bois (50), comprenant :

le fait de prévoir au moins une scie à ruban (1) selon la revendication 1 ;
le fait de fournir du lubrifiant sous pression aux premier et deuxième supports (17, 18) de media poreux ; et
le fait de transporter la pièce de bois sur un convoyeur (40), et
le fait d'actionner ladite au moins une scie à ruban pour couper la pièce de bois.

**13.** Le procédé selon la revendication 12, comprenant en outre le fait de prévoir une pluralité de scies à ruban dans lesquelles les sections de coupe (21) de chaque scie à ruban sont espacées l'une de l'autre, et d'actionner le convoyeur (40) pour effectuer plusieurs coupes simultanées dans la pièce de bois.

**14.** Le procédé selon la revendication 13, dans lequel les scies de la pluralité de scies à ruban ont une même taille.

**15.** Le procédé selon la revendication 12, comprenant en outre le fait de déplacer les premier et deuxième bras de support (12, 13) dans des sens opposés dans la direction verticale pour régler la tension sur la lame de scie à ruban.

**16.** Le procédé selon la revendication 12, comprenant en outre le fait de déplacer les premier et deuxième bras de supports (12, 13) dans des sens opposés dans la direction horizontale pour régler un angle de la lame de scie à ruban dans la section de coupe (21).

**17.** Le procédé selon la revendication 12, comprenant en outre le fait de déplacer les premier et deuxième bras de supports (12, 13) dans la direction horizontale pour déplacer l'emplacement de la section de coupe (21).

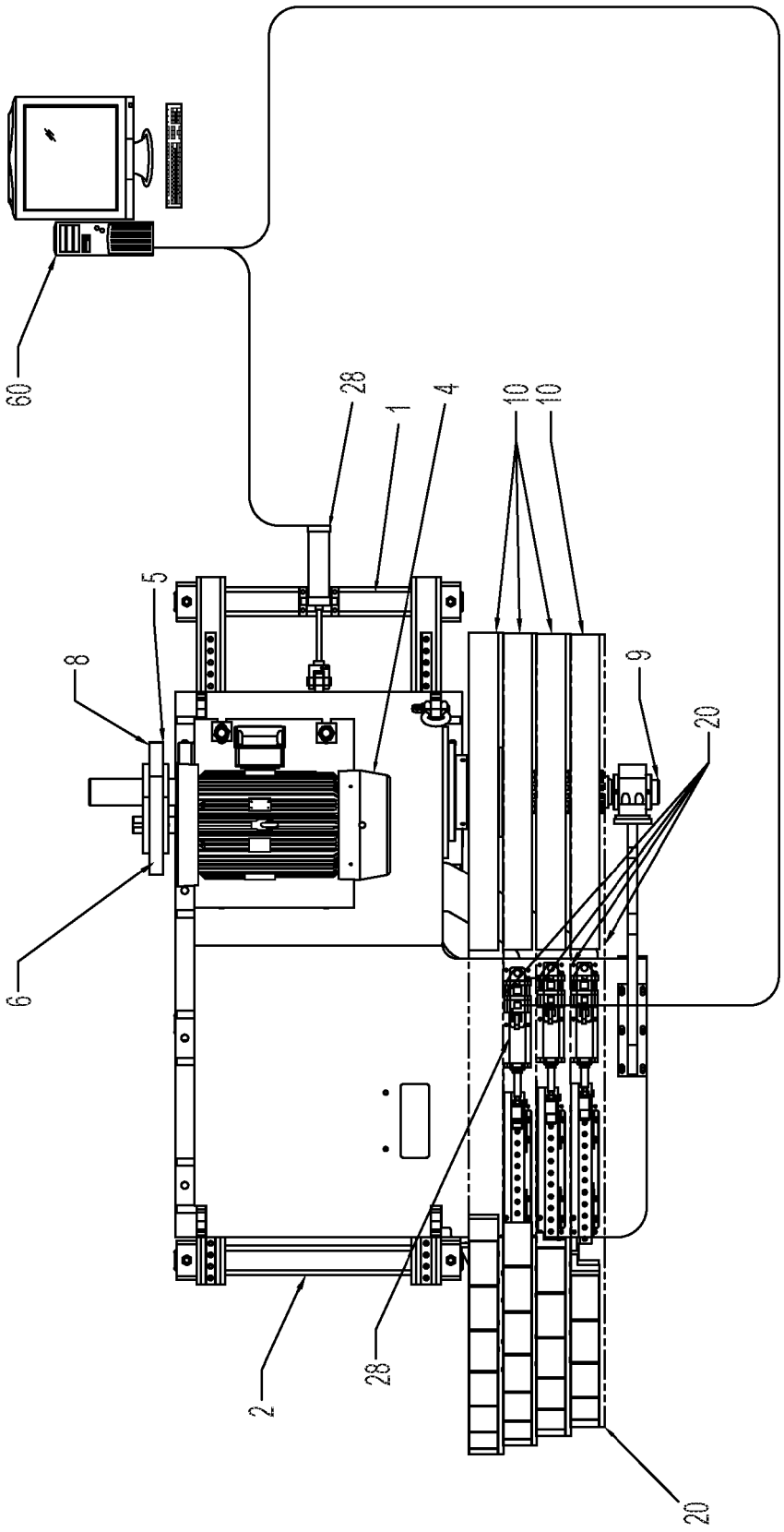


FIG. 1

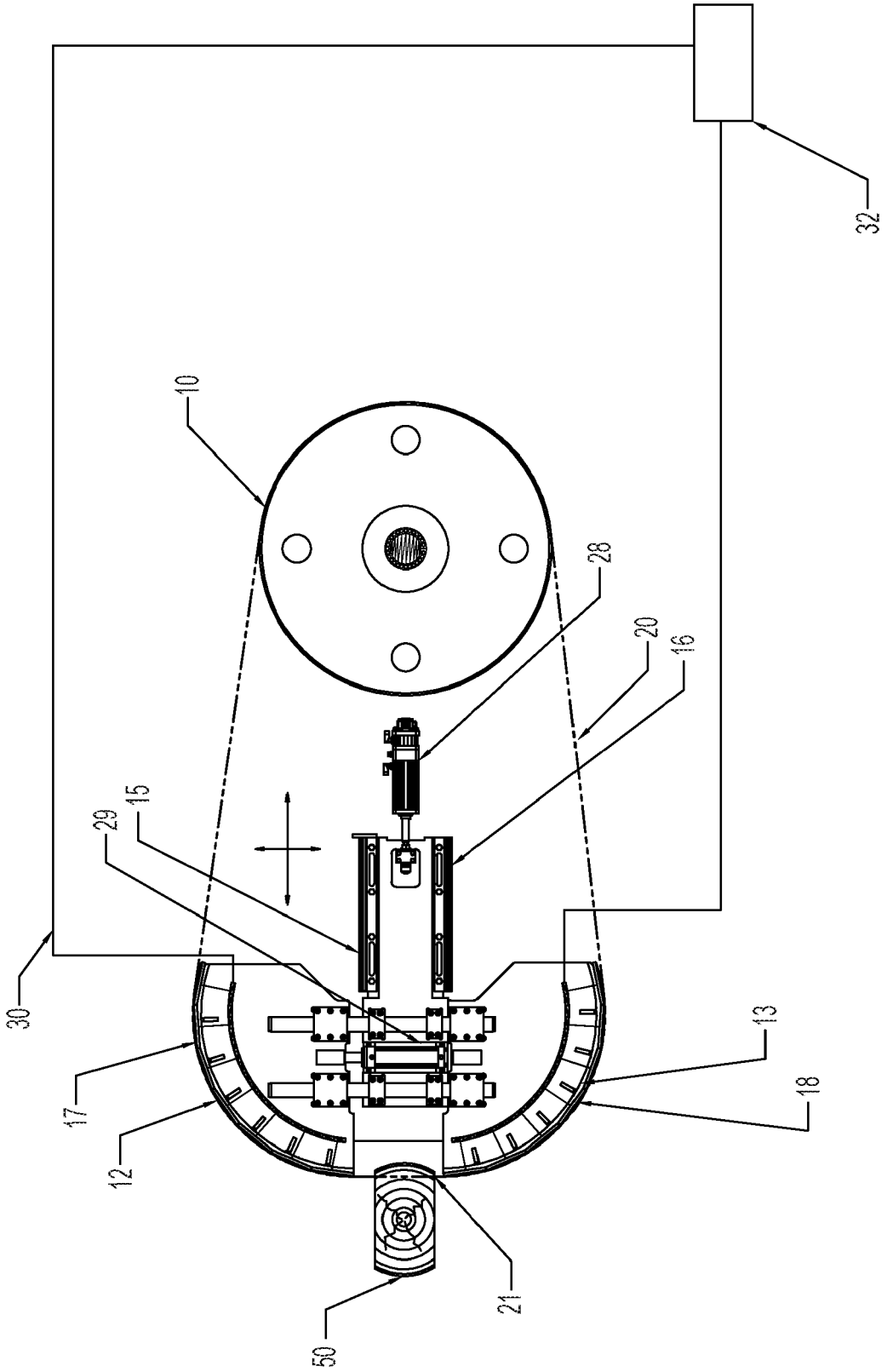


FIG. 2

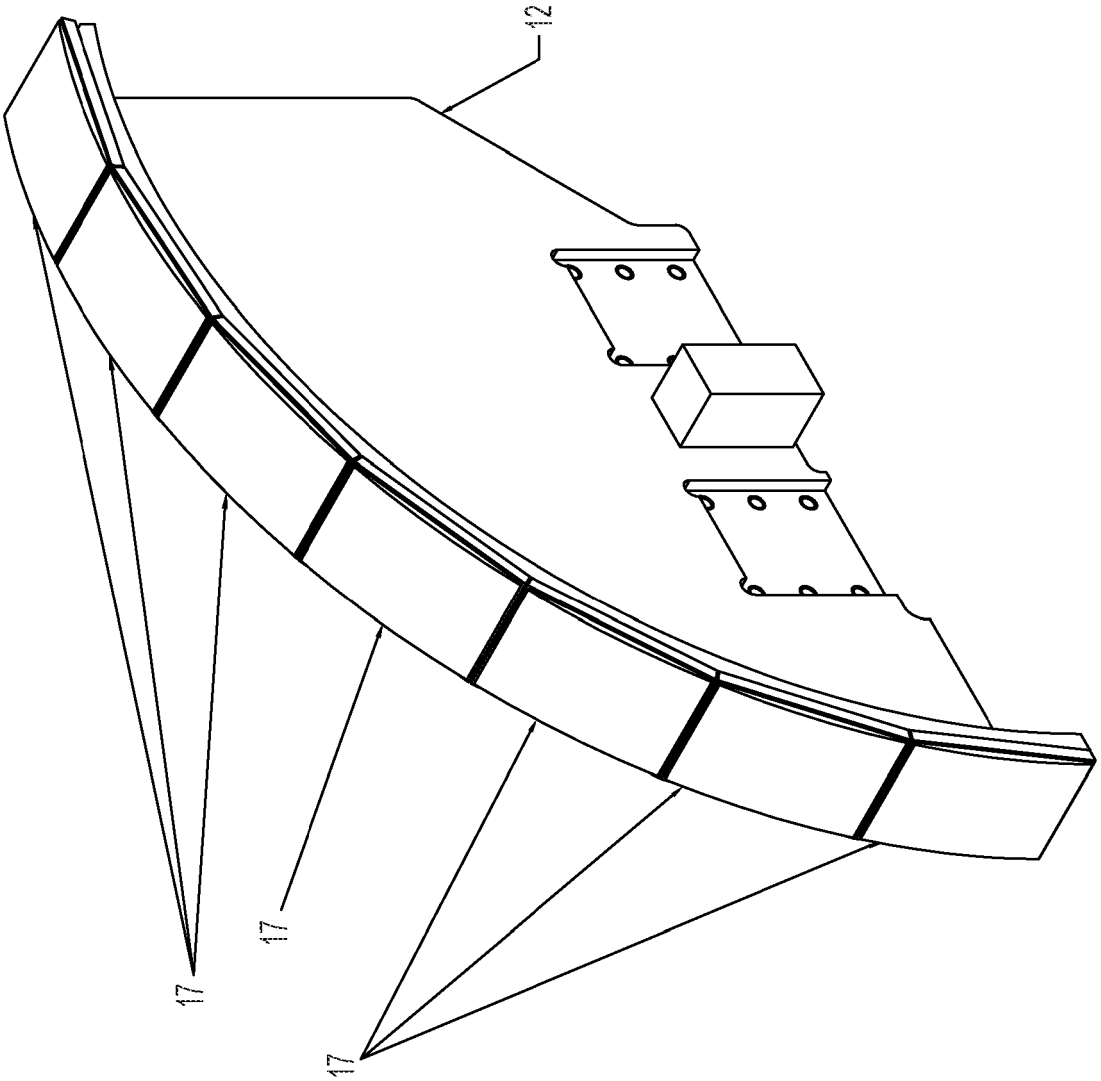


FIG. 3

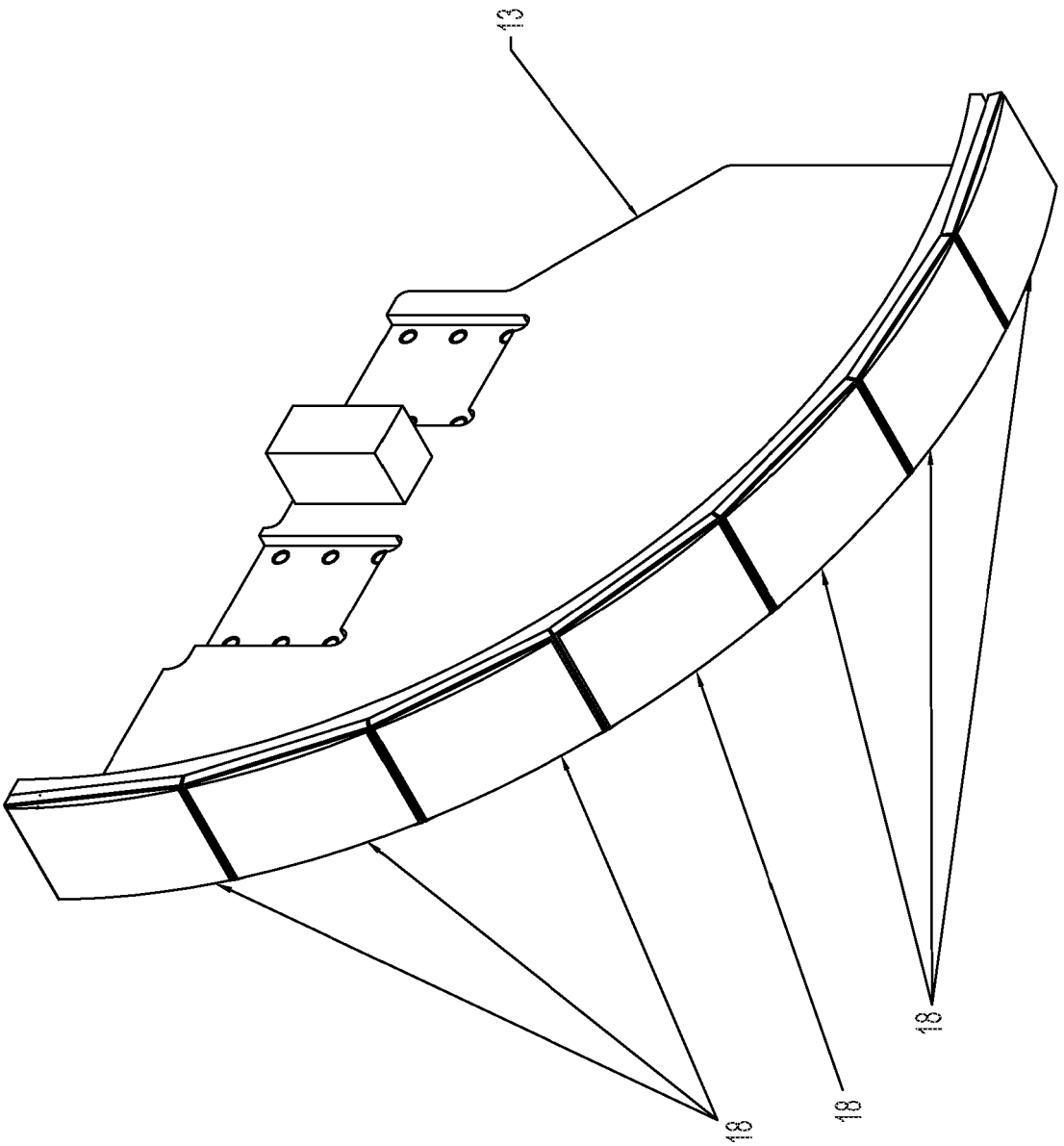


FIG. 4

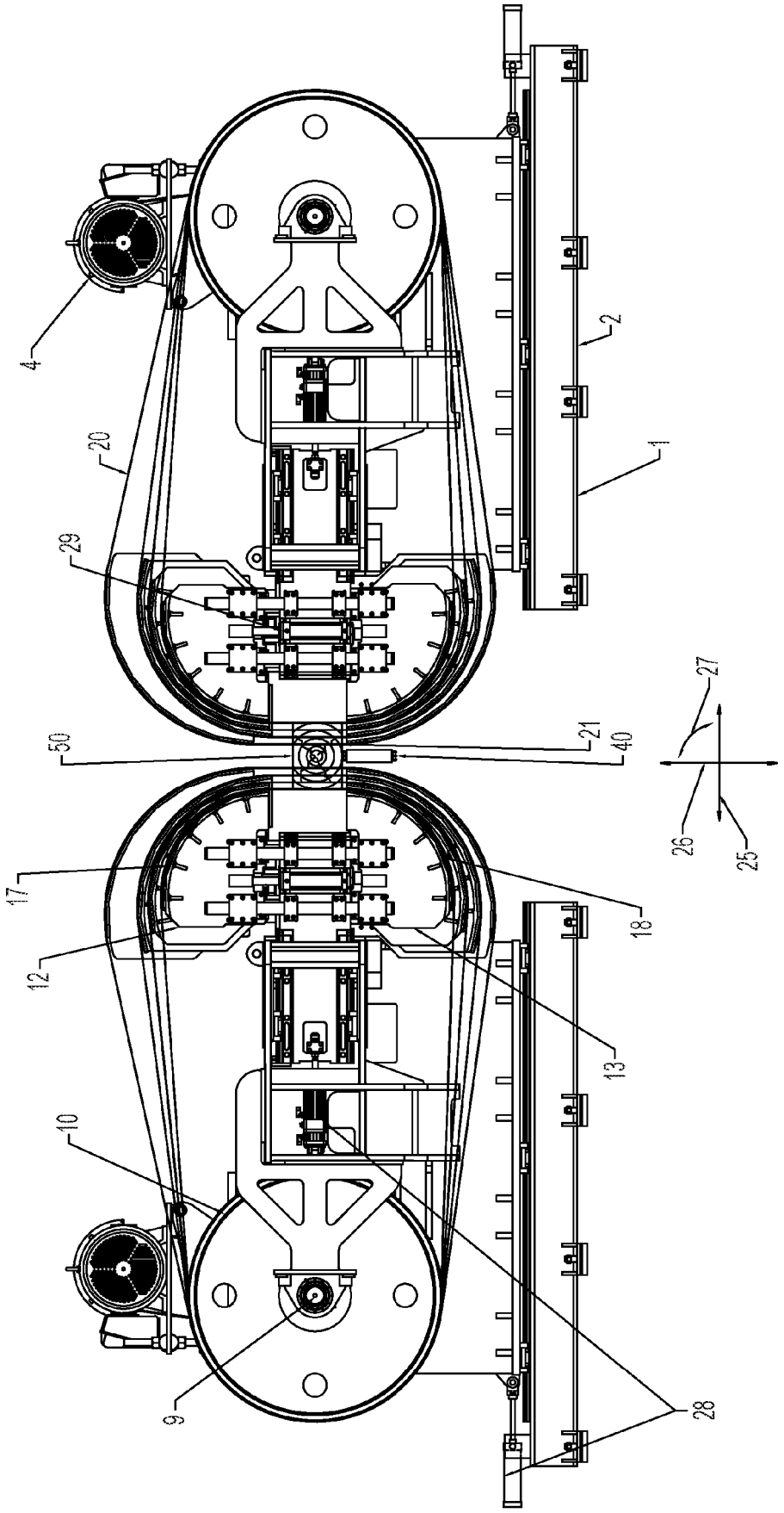


FIG. 5

## REFERENCES CITED IN THE DESCRIPTION

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