Nov. 25, 1952 G. R. H. VULLIET-DURAND 2,619,131

CYCLIC PATH MOTOR-DRIVEN RECIPROCATING SAW MACHINE

Original Filed Nov. 8, 1946 2 SHEETS—SHEET 1

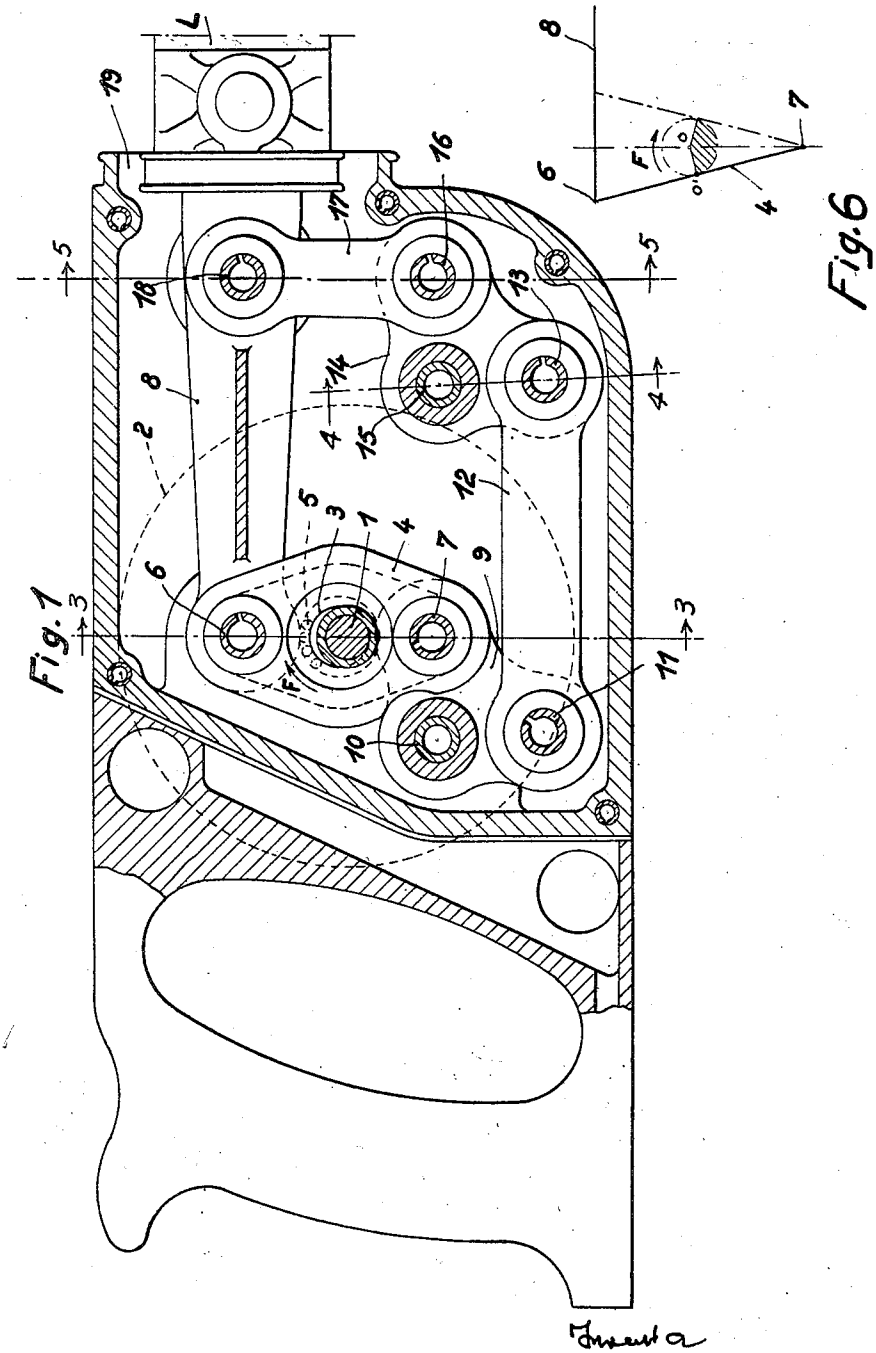


Fig. 1

Fig. 6

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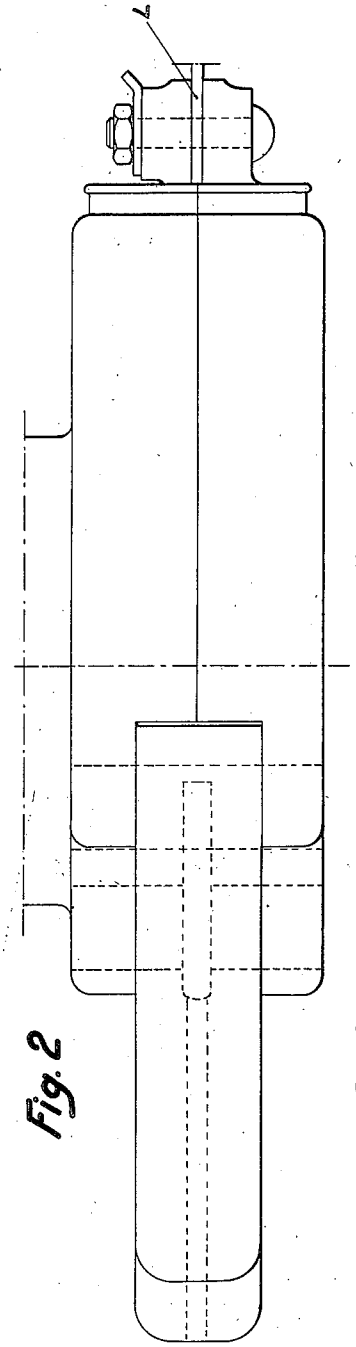


Fig. 2

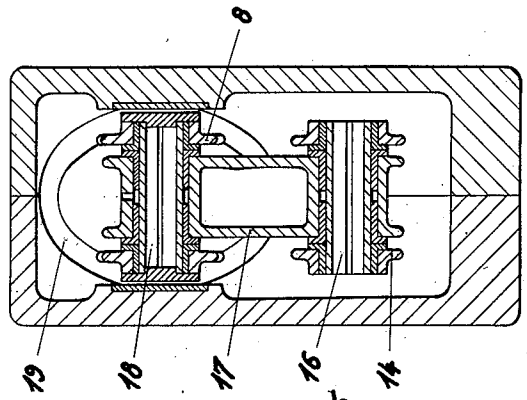


Fig. 5

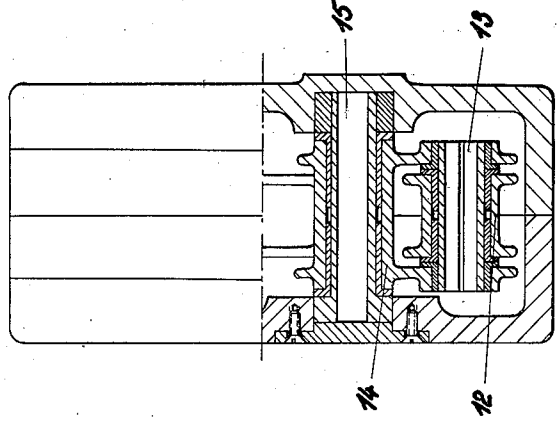


Fig. 4

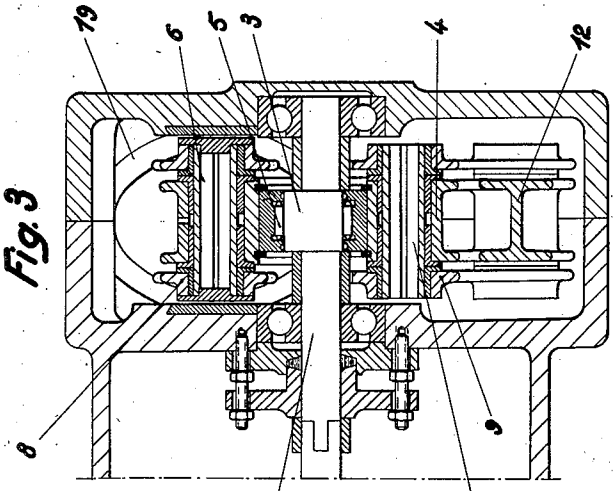


Fig. 3

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Patented Nov. 25, 1952

2,619,131

UNITED STATES PATENT OFFICE

2,619,131

CYCLIC PATH MOTOR-DRIVEN RECIPROCATING SAW MACHINE

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Original application November 8, 1946, Serial No. 708,522. Divided and this application September 9, 1950, Serial No. 183,931. In France July 4, 1946

2 Claims. (Cl. 143—63)

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The present invention relates to a saw and essentially aims to impress, by any means, upon a non circular saw-blade a high velocity movement the amplitude of which may have a value comprised between a portion of the tooth-pitch of the saw and a few times the said tooth-pitch, and in such a manner that the apex of each tooth describes a closed curve, such as a circumferential, elliptical, or oval curve.

The invention may be embodied in a tool or blade-carrier making it possible to obtain the desired movement, the said tool or blade-carrier being constructed in such a manner that the movement impressed on the blade will be slower during the backward swing than during the forward swing.

One embodiment of the invention is illustrated in the annexed drawing, in which:

Fig. 1 shows in section the mechanism of the blade carrying tool making possible to obtain the slow backward swing of the blade.

Fig. 2 is a top plan view of the structure of Fig. 1.

Fig. 3 is a sectional view taken along line 3—3 of Fig. 1 in the direction of the arrows.

Fig. 4 is a sectional view taken along line 4—4 of Fig. 1 in the direction of the arrows.

Fig. 5 is a sectional view taken along line 5—5 of Fig. 1 in the direction of the arrows.

Fig. 6 (sheet 1) is a diagrammatic illustration of the operation of the structure of Fig. 1.

According to the present invention, shaft 1 of electric motor 2 carries eccentric member 3, on which driving link 4 is mounted through a roller bearing 5, or the like, as shown in Figs. 1 and 3.

Link 4 extends on both sides of the shaft 1 and is hinged both at 6 and 7. At 6 it is hinged to one end of a blade holding frame 8 and hinged connection 7 drives a right angle bell-crank lever 9, journaled at 10 between the sides of the apparatus and connected at its second hinged connection 11 to a link 12 journaled at 13 on a second right angle bell-crank lever 14 journaled at 15 between the sides of the apparatus, as shown in Figs. 1 and 4, and a second hinge of which receives a link 17 hinged at 18 on the blade-holding frame 8, as shown in Figs. 1 and 5.

The assembly of links 4, 12, 17 and of right angle bell-crank levers 9 and 14 forms a parallel motion device intended to impress on frame 8 and blade L carried thereby, as shown in Figs. 1 and 2, vertical displacements in parallel planes.

The amplitude of the vertical movement of the blade is twice as large as the eccentricity of member 3. As chosen and illustrated, the amplitude of the horizontal movement is approximately twice that of the vertical movement.

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Consequently, each tooth of the saw describes a practically elliptic closed curve the axes of which are in the relation: 1/2.

If the blade used has a tooth-pitch the value of which is twice the above-mentioned eccentricity, the amplitude of the horizontal movement of the blade is approximately equal to twice the tooth-pitch.

Referring to Fig. 6, in which the eccentricity -o-o' has been exaggerated for the sake of clarity, it is shown that the backward swing of the blade is slower than the forward swing (effective sawing) the duration of which is represented by the shaded sector.

The whole of the mechanism is contained in an oil-tight casing comprising two sides and operates in an oil bath. The orifice 19 through which frame 8 extends outwardly is closed by means of a resilient plug (not shown).

It is to be understood that the present device is in no way limited to the particular embodiment shown as concerns the amplitude of the horizontal movement. In fact, it would be sufficient to increase or reduce the ratio of the lever arms of driving link 4 by correspondingly varying the length of link 17 to increase or reduce the amplitude of the horizontal movement of blade L.

Lastly, it must be appreciated that with the above described device only a single direction of rotation is admitted, viz. the direction shown by arrow F.

Having thus described my invention, what I claim is:

1. A sawing apparatus comprising in combination a frame, a motor fixedly supported on the said frame, a shaft connected to said motor to be rotated thereby, a supporting member, a blade held on the said supporting member, an eccentric fixedly mounted on the said shaft to rotate therewith, a first link rotatably mounted at a central part thereof on the said eccentric and having one end hinged to the said blade supporting member, a second link hinged at one end to the said supporting member at a place removed from the said first link and lever means pivotally mounted on said frame and interconnecting the other ends of the said first and second links at points respectively located at equal distances from the points at which said links are hinged to said supporting member and said first-mentioned points being located from each other by a distance equal to the distance between said second-mentioned points so as to move said blade supporting mem-

ber in a vertical plane while maintaining same parallel to its former position, each of the points on the said blade supporting member describing a closed curve, as the shaft is rotated.

2. A sawing apparatus comprising in combination a frame, a motor fixedly supported on the said frame, a shaft connected to the said motor to be rotated thereby, a supporting member, a blade held on the said supporting member, an eccentric fixedly mounted on said shaft to rotate therewith, a first link rotatably mounted at a central part thereof on the said eccentric and having one end hinged to the said supporting member, a second link hinged at one end to the said supporting member at a place removed from the said first link, a pair of bell-crank levers each of them hinged to the said frame and one of said levers having one arm hinged to the other end of one of said links and the other lever having an arm hinged to the other end of the other link, the points at which said levers are connected to said links being respectively located at equal distances from the points at which said

links are connected to said supporting member and said first-mentioned points being spaced from each other by a distance equal to the distance between said second-mentioned points, a connecting link connecting the other arms of the said bell-crank levers, thus forming a parallel motion device making possible to impress on the said blade supporting member a movement in a vertical plane while maintaining the said member parallel to its former position, each point on the said member and, consequently, each tooth of the blade describing a closed curve, as the shaft is rotated.

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