No. 628,486. Patented July 11, 1899.

G. A. McLANE.

APPARATUS FOR TURNING IRREGULAR FORMS.

(Application filed Sept. 28, 1898.)

(No Model.)

Fig. 1.

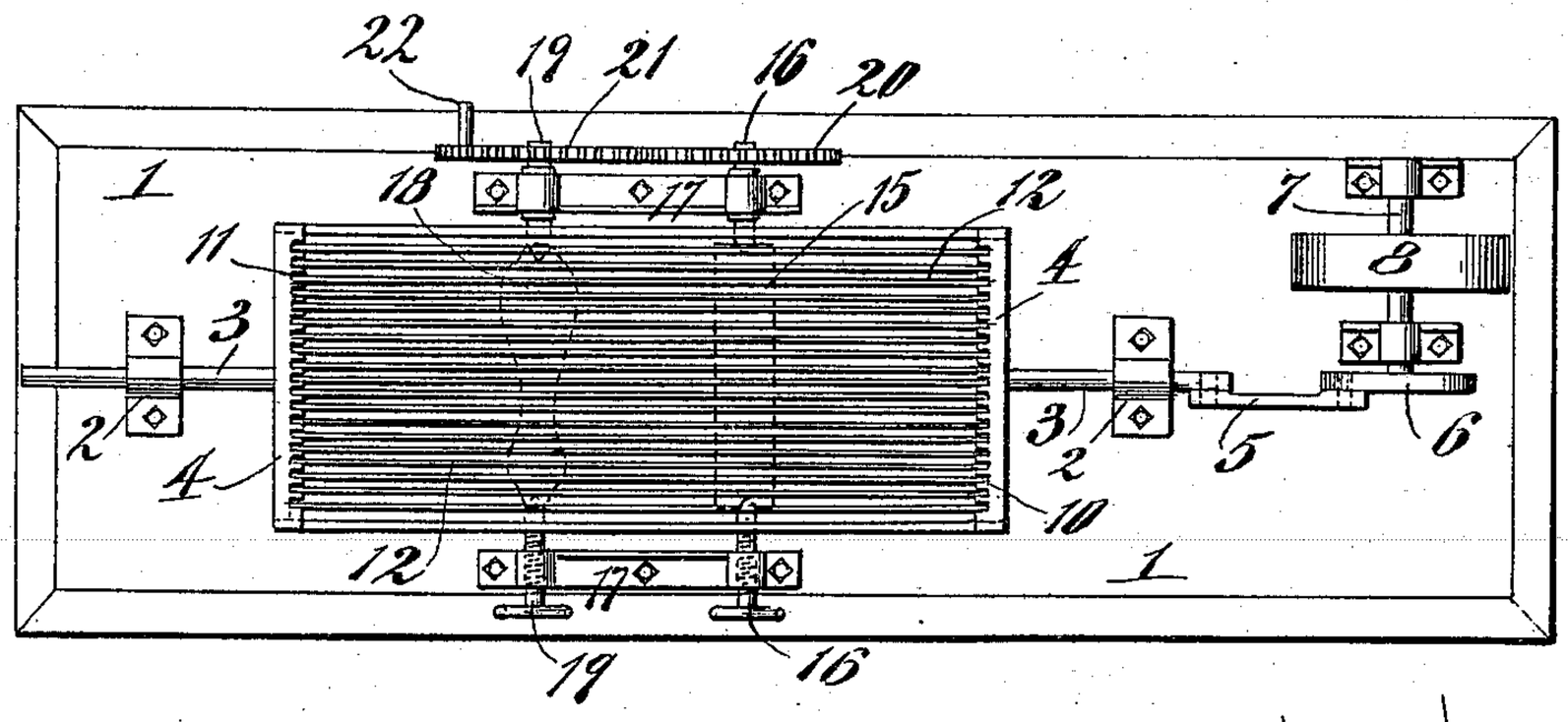


Fig. 2.

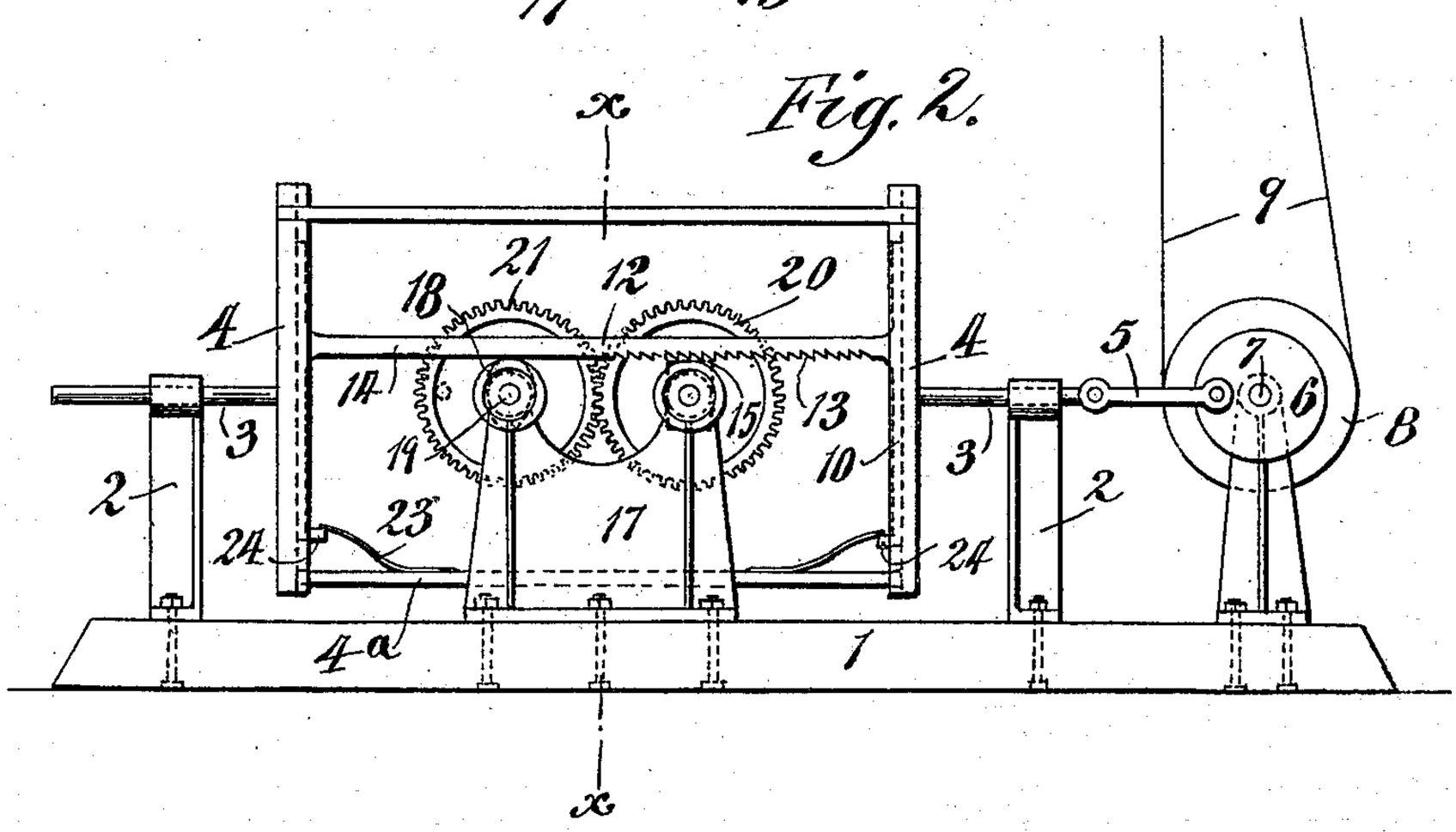
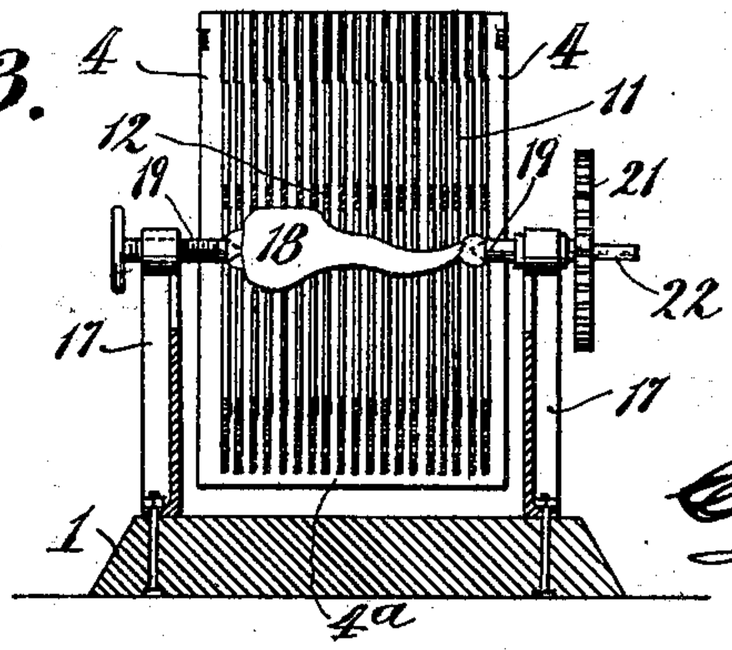


Fig. 3.



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APPARATUS FOR TURNING IRREGULAR FORMS.

SPECIFICATION forming part of Letters Patent No. 628,486, dated July 11, 1899.

Application filed September 28, 1898. Serial No. 692,057. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ALVAH McLANE, a citizen of the United States, and a resident of New York, (Bay Ridge,) county of Kings, and State of New York, have invented certain new and useful Improvements in Apparatus for Turning Irregular Forms, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar numerals of reference indicate corresponding parts.

My invention relates to lathe apparatus for turning irregular forms, and has for its object to provide improved mechanism permitting the turning of lasts, gun-stocks, or other irregularly-formed objects to be accomplished more quickly and cheaply than by prior machinery of this general character.

The invention will first be described and then will be defined in claims hereinafter set forth.

In the drawings, Figure 1 is a plan view of one arrangement of improved apparatus using reciprocating cutters and adapted for turning boot or shoe lasts. Fig. 2 is a side elevation thereof, and Fig. 3 is a transverse vertical sectional view taken on the line *x x* in Fig. 2.

My invention may be embodied in a machine or apparatus using a series or gang of cutting, abrading, or finishing tools of any character, such as reciprocating or circular saws, rasps, files, sand or emery paper, or other cutting or abrading or finishing surfaces.

The invention may be sufficiently illustrated and described as embodied by way of example in the apparatus for producing boot or shoe lasts shown in the drawings.

To any suitable support or frame, such as the bed-plate 1, are fastened guide-bearings 2 2, in which are fitted the opposite end shafts 3 3 of a frame 4, adapted for reciprocation by any suitable mechanism, such as a connecting-rod 5, coupled to a crank-disk 6 on a shaft 7, carrying a pulley 8, turned by a belt 9 from any convenient motor.

In vertical slots in the opposite ends of the frame 4 are fitted a series of slides 10 11 in pairs, and to each pair are fixed the opposite ends of a blade 12, having a portion of its length—say about one-half—formed with saw-teeth 13 at the lower edge, the remaining portion 14 thereof being smooth. The saw-teeth 13 are adapted to cut a block 15 of wood or other material, which is held in chucks or lathe-heads 16 16, revoluble in journals of bearings 17 17, here shown fixed to the bed-plate 1. The smooth edge portions 14 of blades 12 are adapted to bear on a pattern 18—say of a boot or shoe last—supported by revoluble lathe-heads 19 19, sustained by bearings 17. These lathe-heads 16 19 may have any suitable construction permitting clamping and rotation of the block and pattern. As a convenient means for simultaneously rotating the block and pattern I show two intermeshing gear-wheels 20 21 on the adjacent lathe-heads 16 19, one of said wheels having a handle 22, by which rotation may be effected by hand; but any other rotative means may be adopted.

Each blade 12 may move up and down as guided in the frame 4, independently of every other like blade. Gravity alone may cause the cutting edges of the blades to reduce the block 15; but any degree of force may be applied to hold these cutting edges to the block for more rapidly turning the same, and by any approved means—such, for instance, as springs 23, held to the bottom 4^a of the frame 4 and acting on lugs 24 on the opposite slides 10 11, supporting each blade.

In operation after the block 15 and pattern 18 are secured to their respective lathe-heads 16 19 beneath the series or gang of blades 12 the frame 4 will be reciprocated and the block and pattern will be slowly turned by turning the handle 22. The cutting portions 13 of all the independently-movable blades 12 will simultaneously act at different points on the block 15, while the smooth blade portions 14 will govern or limit the depth of cutting of the blades by contact with the pattern 18, and in comparatively brief time the entire block will be reduced to conform to the shape of the pattern. When only one set or gang of blades 12 is used, the block will be reduced to the shape of the pattern, as both block and pattern are given one complete revolution; but should an opposite under series of blades also be used with the upper series shown, and as may be done, but one-half revolution of the block and pattern will suffice. I do not herein show such opposite under series of blades, it being well understood that these are simply a duplication of the upper series inversely arranged.

To prevent leaving uncut portions of the

block, I incline the blade-carrying frame slightly from a plane at right angles to the axes of the block and pattern—say, about one sixty-fourth of an inch or sufficient for the purpose with any special series or gang of blades—which will impart corresponding lateral movement to the acting teeth or cutters of the blades, thereby entirely clearing surplus material from the block and turning it, perhaps a little roughly, to the shape of the pattern, as will be readily understood.

I may smooth-finish the roughly-turned last or gun-stock or other article by using a series of blades 12, having smooth faces bearing on the same or a slightly-reduced pattern and provided, instead of the routing or cutting teeth 13, with rasping or sandpapering surfaces bearing on the roughly-turned block.

It is not deemed necessary to show the form of smooth-finishing blade just described, as the same is identical with the turning-blade, as hereinbefore set forth, except that in lieu of the teeth 13 it has a rasp or sandpapering operating edge or surface.

By using a series of cutters acting simultaneously at different points on or along the block in connection with bearing-surfaces limiting the depth of operation of each cutter by resting on a pattern I am able to turn irregular forms very quickly, cheaply, and perfectly by comparatively simple and effective mechanism, not involving the usual bodily lateral feed of cutting-tools along the entire length of the block.

The term "cutting edges" used in this specification is to be construed as including any kind of toothed edge or rasping or sandpapering surface adapted either for rough-cutting or fine-finishing the last or other article.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Apparatus for turning irregular forms, comprising a series of cutting edges or surfaces adapted for simultaneous action at different points on a block to be turned, a pattern, a corresponding series of gages extended in a direct plane from the respective cutting members and bearing on the pattern thereby limiting action of the cutters and their respective gage extensions in a simultaneous corresponding movement on the block, means operating the cutters, and means rotating the block and pattern while being acted on by the cutters and gages, the cutters and their gages being arranged in a continuous parallel gang and respectively having an independent variable movement whereby the whole gang follows the complete variable contour planes of the pattern, and the relative construction and arrangement being such that the movement of the cutters and their gages is in the direction of the extension of the gages and at right angles to the pattern action, substantially as described.

2. Apparatus for turning irregular forms, comprising a series of cutting edges or surfaces adapted for simultaneous action at different points on a block to be turned, a pattern, a corresponding series of gages extended in a direct plane from the respective cutting members and bearing on the pattern thereby limiting action of the cutters and their respective gage extensions in a simultaneous corresponding movement on the block, means operating the cutters, and means rotating the block and pattern while being acted on by the cutters and gages; said cutters moving in planes inclined to the plane of rotation of the block thereby clearing it of all surplus material, the cutters and their gages being arranged in a continuous parallel gang and respectively having an independent variable movement whereby the whole gang follows the complete variable contour planes of the pattern, substantially as described.

3. Apparatus for turning irregular forms, comprising a series of cutting edges or surfaces adapted for simultaneous action at different points on a block to be turned, a pattern, a corresponding series of gages extended in a direct plane from the respective cutting members and bearing on the pattern thereby limiting action of the cutters and their respective gage extensions in a simultaneous corresponding movement on the block, means operating the cutters, means forcing the operating-cutters to the block, and means rotating the block and pattern while being acted on by the cutters and gages, the cutters and their gages being arranged in a continuous parallel gang and respectively having an independent variable movement whereby the whole gang follows the complete variable contour planes of the pattern, and the relative construction and arrangement being such that the movement of the cutters and their gages is in the direction of the extension of the gages and at right angles to the pattern action, substantially as described.

4. Apparatus for turning irregular forms, comprising a series of cutting edges or surfaces adapted for simultaneous action at different points on a block to be turned, a pattern, a corresponding series of gages extended in a direct plane from the respective cutting members and bearing on the pattern thereby limiting action of the cutters and their respective gage extensions in a simultaneous corresponding movement on the block, means operating the cutters, means forcing the operating-cutters to the block, and means rotating the block and pattern while being acted on by the cutters and gages; said cutters moving in planes inclined to the plane of rotation of the block thereby clearing it of all surplus material, the cutters and their gages being arranged in a continuous parallel gang and respectively having an independent variable movement whereby the whole gang follows the complete variable contour planes of the pattern, substantially as described.

5. Apparatus for turning irregular forms, comprising a series of reciprocatory cutters

having independent vertical movement and adapted for simultaneous action at different points on a block to be turned, a corresponding series of gages extended in a direct plane from the respective cutting members and simultaneously and correspondingly moving with the cutters, a pattern on which the gages bear to limit action of the cutters on the block, means reciprocating the cutters and their gage extensions, and means rotating the block and pattern while being acted on by the cutters and gages, the cutters and their gages being arranged in a continuous parallel gang and respectively having an independent variable movement whereby the whole gang follows the complete variable contour planes of the pattern, and the relative construction and arrangement being such that the movement of the cutters and their gages is in the direction of the extension of the gages and at right angles to the pattern action, substantially as described.

6. Apparatus for turning irregular forms, comprising a series of reciprocatory cutters having independent vertical movement and adapted for simultaneous action at different points on a block to be turned, a corresponding series of gages connected to and moving with the cutters, a pattern on which the gages bear to limit action of the cutters on the block, means reciprocating the cutters, and means rotating the block and pattern while being acted on by the cutters and gages; said cutters moving in planes inclined to the plane of rotation of the block thereby clearing it of all surplus material, substantially as described.

7. Apparatus for turning irregular forms, comprising a series of reciprocatory cutters having independent vertical movement and adapted for simultaneous action at different points on a block to be turned, a corresponding series of gages connected to and moving with the cutters, a pattern on which the gages bear to limit action of the cutters on the block, means reciprocating the cutters, means forcing the acting cutters to the block, and means rotating the block and pattern while being acted on by the cutters and gages, substantially as described.

8. Apparatus for turning irregular forms, comprising a series of reciprocatory cutters having independent vertical movement and adapted for simultaneous action at different points on a block to be turned, a corresponding series of gages connected to and moving with the cutters, a pattern on which the gages bear to limit action of the cutters on the block, means reciprocating the cutters, means forcing the acting cutters to the block, and means rotating the block and pattern while being acted on by the cutters and gages; said cutters moving in planes inclined to the plane of rotation of the block, thereby clearing it of all surplus material, substantially as described.

9. Apparatus for turning irregular forms, comprising a reciprocatory frame 4 having a series of grooves at opposite ends, pairs of slides 10, 11 movable in said groove, blades 12 having a cutting portion 13 and gage portion 14 and connected to said slides, a pattern revoluble under gages 14 of the blades and controlling action of their cutting portions 13 on a block revoluble with the pattern, means reciprocating the frame 4, and means rotating the block and pattern while being acted on by the cutters and gages, substantially as described.

10. Apparatus for turning irregular forms, comprising a reciprocatory frame 4 having a series of grooves at opposite ends, pairs of slides 10, 11 movable in said grooves, blades 12 having a cutting portion 13 and gage portion 14 and connected to said slides, a pattern revoluble under gages 14 of the blades and controlling action of their cutting portions 13 on a block revoluble with the pattern, means reciprocating the frame 4, means forcing the slides downward to hold the blades 12 to the block and pattern, and means rotating the block and pattern while being acted on by the cutters and gages, substantially as described.

11. Apparatus for turning irregular forms, comprising a reciprocatory frame 4, having a series of grooves at opposite ends, pairs of slides 10, 11 movable in said grooves, blades 12 having a cutting portion 13 and a gage portion 14 and connected to said slides, a pattern revoluble under gages 14 of the blades and controlling action of their cutting portions 13 on a block revoluble with the pattern, means reciprocating the frame 4, and means rotating the block and pattern while being acted on by the cutters and gages; said frame 4 with its blades 12, 13, 14 moving in planes inclined to the plane of rotation of the block thereby clearing it of all surplus material, substantially as described.

12. Apparatus for turning irregular forms, comprising a reciprocatory frame 4 having a series of grooves at opposite ends, pairs of slides 10, 11 movable in said grooves, blades 12 having a cutting portion 13 and gage portion 14 and connected to said slides, a pattern revoluble under gages 14 of the blades and controlling action of their cutting portions 13 on a block revoluble with the pattern, means reciprocating the frame 4, means forcing the slides downward to hold the blades 12 to the block and pattern, and means rotating the block and pattern while being acted on by the cutters and gages; said frame 4 with its blades 12, 13, 14 moving in planes inclined to the plane of rotation of the block thereby clearing it of all surplus material, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 26th day of September, 1898.

GEORGE ALVAH McLANE.

Witnesses:

MARCELLA G. McLEAN,

BESSIE F. FINDLAY.