April 15, 1924. 1,490,555

A. F. BORCHERS

SANDING MACHINE

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Fig. 1

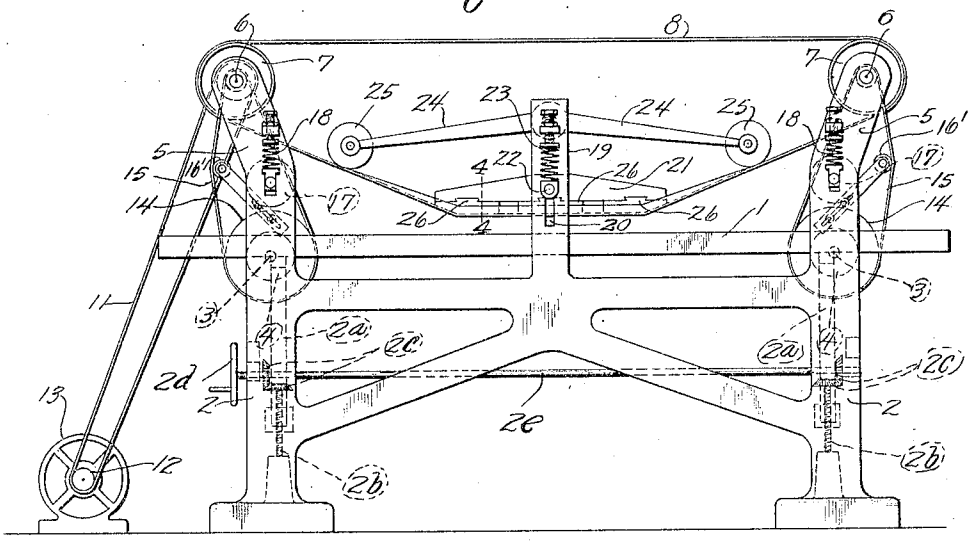
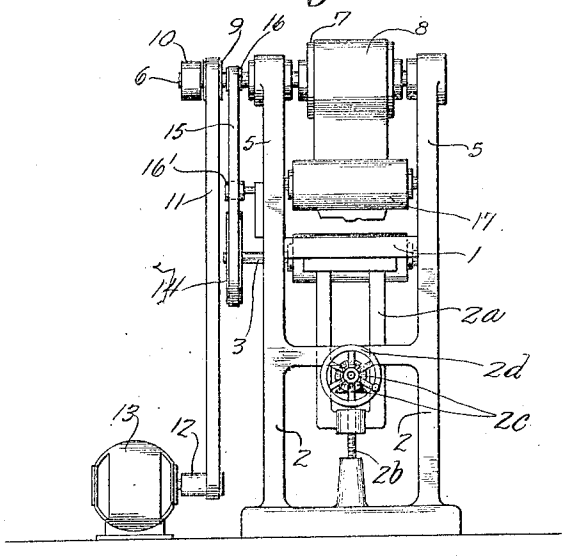


Fig. 2



Witness
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Fig. 3

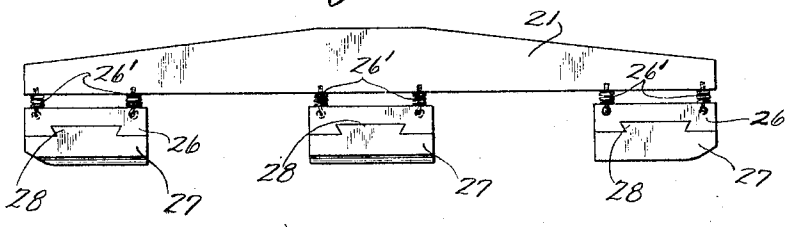



Fig. 4

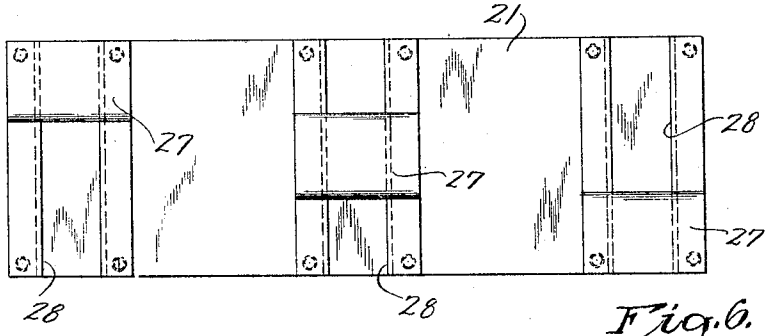



Fig. 6.

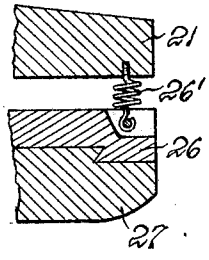
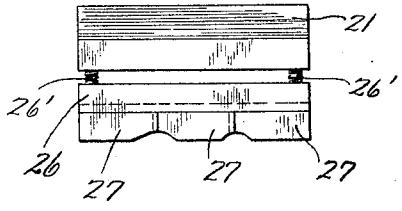



Fig. 5




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Patented Apr. 15, 1924. 1,490,555

# UNITED STATES PATENT OFFICE.

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## SANDING MACHINE.

Application filed February 20, 1922. Serial No. 537,361.

*To all whom it may concern:*

Be it known that I, ANTON F. BORCHERS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sanding Machines, of which the following is a specification.

The present invention relates to sanding machines.

More particularly the present invention relates to means for expeditiously sanding the surfaces of wood or other material and contemplates the novel use of an endless sanding belt for this purpose.

An object of the present invention is to provide a sanding machine wherein members to be sanded may be efficiently operated upon.

A further object is to provide a sanding machine employing an endless belt in which strips of material, such as molding and the like, of practically any cross sectional contour may be operated upon.

A further object is to provide a sanding machine which is simple in construction, relatively cheap to manufacture, and reliable in its operation.

Further objects will appear as the description proceeds.

Referring to drawings—

Figure 1 is a side elevation of one embodiment of the present invention;

Figure 2 is an end elevation of the machine illustrated in Figure 1;

Figures 3, 4 and 5 represent in side elevation, bottom plan and end elevation respectively, a modified construction.

Figure 6 represents a detail of construction showing on an enlarged scale part of the structure shown in Figure 3.

According to the present invention, a table is provided having means for feeding along said table the members to be operated upon, said table also having means for raising and lowering same. Novel means are provided, according to the present invention, for operating upon said members while they are being moved along said table, which means will be described in detail.

Numeral 1 indicates a table which may be elongated as shown in Figures 1 and 2, said table being mounted upon suitable supports 2—2 in a manner to be vertically adjustable. For the purpose of providing this vertical adjustability of the table 1, the table 1 and supports may be provided with side bearings and the weight of said table may be carried by two uprights $2^a$—$2^a$, one of which is arranged adjacent to each end of the table. Each of said uprights may be operated by a vertically extending screw $2^b$, operated by bevel gears $2^c$—$2^c$, which, in turn, may be operated by means of the hand wheel $2^d$ acting through the longitudinally extending rod $2^e$. Operatively associated with said table 1 are a pair of transverse shafts 3—3 which carry rolls 4—4 for providing feeding motion to members such as strips of molding, parts of furniture, or other members to be sanded.

Co-operating with the supports 2—2 at each end of the machine are a pair of upright supports 5—5 which provide bearings for transversely extending shafts 6—6. Said shafts 6—6 carry a pair of pulleys 7—7 which support the endless sanding belt 8, which is provided with abrasive material on its outer side, the details and functions of which belt will be referred to hereinafter. One of the shafts 6 may be provided with a pair of pulleys 9 and 10, of which one may be loose on said shaft 6 and the other may be tight upon said shaft 6. A belt 11 may be provided for connecting said pulleys 9 and 10 with the pulley 12 of a motor 13. Operative driving connection between said motor and the sanding machine may be established or disestablished by moving said belt 11 from one to the other of the pulleys 9 and 10. Each of the transverse shafts 3—3 is provided with a pulley 14 having operative connection by means of a belt 15 with a pulley 16 mounted upon the adjacent transverse shaft 6. Adjustable idler pulleys 16′—16′ may be provided for taking up the slack in belts 15—15 when the table 1 is raised. It will be understood that the details of structure involved in the vertical adjustability of table 1 do not go to the root of the present invention and may be varied within wide limits. According to the drawing, power is communicated to the feed roller 4 by means of the sanding belt 8. It will be understood, however, that, if preferred, power may be communicated to the feeding rollers in any other preferred way.

Mounted in the upright supports 5—5 are a pair of rollers 17—17 which are mounted in vertical slots in said supports 5—5 whereby to permit a vertical movement of said

rollers 17—17. Springs 18—18 may be provided for urging said rollers 17—17 downwardly whereby to cause same to contact with the members which are being fed through the machine.

Mounted at each side of the machine midway of the length thereof is an upright support 19 provided with a vertical slot 20. The numeral 21 indicates a templet holder having pins 22 (only one being shown) slidably mounted in the slots 20. According to the embodiment shown in Figure 1, springs 23 will co-operate with the pins 22 to urge said matrix holder 21 downwardly. Said templet holder 21 is mounted within the confines of the endless belt 8 and carries members, referred to more in detail hereinafter, for shaping said belt 8, which should be of flexible material, to conform to the outline of the members to be operated upon. Said upright supports 19 also form pivotal mounting means for a pair of arms 24—24, which arms 24—24 at their outer ends carry idling rollers 25—25. Said rollers 25—25 contact with the inner surface of the sanding belt 8 and serve to smooth out said belt and hold same taut.

The templet holder 21 may be equipped with means for resiliently mounting the members which contact with the inner surface of the belt 8. One construction of matrix holder, together with the members resiliently carried thereby as distinguished from mounting the templet holder resiliently as a whole, is illustrated in Figures 3, 4 and 5. According to the disclosure in these figures, a plurality of guide pieces 26 are resiliently carried by the member 21 on the under side thereof. Springs 26′—26′, which may be secured to both the templet holder 21 and the guide pieces 26, permit a very considerable play of said guide pieces. Figure 6 represents one way in which the springs 26′ may be connected to the templet holder 21 and the guide pieces 26. The specific means for providing the connection between these members forms no part of the present invention and the showing of Figure 6 is to be considered as diagrammatic. The guide pieces 26 carry templets or shaping members 27—27, the members 27 being illustrated as having a slidable connection with the guide pieces 26—26 transversely of the matrix holder 21, that is, transversely of the machine. According to the illustration, each of the templets 27 is provided with a dovetailed tongue 28 riding in a corresponding slot in its corresponding guide piece 26. The templets 27 should be capable of movement transversely of the machine, but if preferred may be limited in such motion in any preferred way. Each of the templets 27 extends only a fractional part of the distance across the corresponding guide piece 26 and said guide pieces and their corresponding templets should preferably be spaced apart longitudinally of the matrix holder 21. The total width of the templets should be greater than the section of belt to be shaped, that is to say, the region of belt operated upon by the forward templet should be overlapped by the region of belt operated upon by the next templet, this arrangement being carried out with all the templets. Expressed in other language, the templets should be arranged in overlapping relationship.

A mode of operation of the above described embodiment of the present invention will be obvious without detailed description. It will be clear that the templets 27 will be urged by the springs 23 against the inner side of the belt 8 and will shape the cross sectional contour of said belt. The templets 27 are readily removable and replaceable and may be chosen to give the desired conformation of the belt for the particular members to be sanded. The members to be sanded will be fed along the machine by reason of the positive rotation of rolls 4—4 and will be securely held down to the table 1 by reason of their engagement with the spring-pressed rolls 17—17. The belt 8 will be driven in a direction to oppose the movement of the members to be sanded. The templets will have a cross sectional outline approximating a counterpart of the cross sectional outline of the members to be sanded, due allowance being made for the thickness of the belt 8. The sectional arrangement of templets has the advantage that the distortion of the belt 8 at any point is minimized and the total friction is also minimized. Inasmuch as the regions of the belt which are operated upon by the various templets are overlapped, a clean and uniform finishing operation is accomplished.

In practice, warped and crooked molding is often encountered. It is not always feasible to apply sufficient pressure to this distorted molding to straighten same out during the sanding operation. According to the present invention the resilient mounting of the guide pieces 26—26 affords a very considerable degree of play in the templets 27—27 whereby said templets may accommodate themselves to the distorted molding. The convolutions of the lower bearing surfaces of the templets 27—27 will conform to the convolutions of the molding being sanded, the transverse play of the matrices in the guide pieces 26 facilitating this action.

By reason of the fact that the table 1 may be raised or lowered, molding of any thickness within limits may be accommodated. The present invention provides means whereby all the belts may be kept taut, though it will be understood that the invention is not limited to any particular type of driving mechanism. Though means are

provided for keeping the sanding belt 8 taut under operating conditions, it will be obvious that said belt 8 may readily be relieved to permit the ready changing of the templets 27—27 for operation upon different designs of molding. It will be noted that no contact with the sanded side of the belt 8 is necessary except the contact which is desired between said sanded side and the members to be operated upon.

One embodiment of the present invention has been described in detail. Many modifications will occur to those skilled in the art. It is intended in this patent to cover all such modifications that fall within the scope of the invention as defined by the appended claims.

I claim:

1. Finishing mechanism comprising an endless belt having abrasive material mounted on, the outer side thereof, plural shaping means contacting with the inner side thereof, and holding means for said shaping means, said shaping means being mounted in stepped relation to one another, spaced lengthwise of said belt and movable transversely of said belt.

2. Finishing mechanism comprising an endless belt having abrasive material on the outer side thereof, shaping means contacting with the inner side thereof, and holding means for said shaping means, said shaping means comprising a plurality of members spaced longitudinally of said belt and transversely of said belt, said holding means being adapted to permit movement of said shaping means transversely of said belt.

3. Finishing mechanism comprising an endless belt having abrasive material on the outer side thereof, plural shaping means contacting with the inner side of said belt, and holding means for said shaping means, said shaping means being mounted in stepped relation to one another, said shaping means being spaced lengthwise of the belt and having mutually overlapping boundaries, said holding means being adapted to permit movement of said shaping means transversely of said belt.

4. Finishing mechanism comprising an endless belt having abrasive material mounted on the outer side thereof, a shaping member contacting with the inner side thereof, and holding means for said shaping member, said shaping member having slidable connection with said holding means whereby to be movable transversely of said belt.

5. Finishing mechanism comprising an endless belt having abrasive material on the outer side thereof, shaping means contacting with the inner side thereof, and holding means for said shaping means, said shaping means comprising a plurality of members spaced longitudinally of said belt and transversely of said belt, said shaping means being connected to said holding means by means permitting play of said shaping means transversely of said belt.

6. Finishing mechanism comprising an endless belt having abrasive material on the outer side thereof, plural shaping means contacting with the inner side of said belt, and holding means for said shaping means, said shaping means being mounted in stepped relation to one another, said shaping means being spaced lengthwise of the belt and having mutually overlapping boundaries, said shaping means being connected to said holding means by means permitting play of said shaping means transversely of said belt.

7. Finishing mechanism comprising an endless belt having abrasive material mounted on the outer side thereof, plural shaping means contacting with the inner side thereof, and holding means for said shaping means, said shaping means being mounted in stepped relation to one another and spaced lengthwise of said belt, said shaping means being individually connected to said holding means by means of springs and being movable transversely of said belt.

8. A finishing machine comprising an elongated frame provided with pulleys at the two ends thereof and supporting members spaced midway of the length thereof, shaping means placed substantially symmetrically with reference to said pulleys, said shaping means being carried by said supporting members, and belt tightening means carried by said supporting members, said belt tightening means being symmetrically mounted with reference to said supporting members, said shaping means being movable transversely of said belt.

9. A finishing machine comprising an elongated frame provided with pulleys at the two ends thereof and supporting members spaced midway of the length thereof, shaping means placed substantially symmetrically with reference to said pulleys, said shaping means being carried by said supporting members, and belt tightening means carried by said supporting members, said belt tightening means being symmetrically mounted with reference to said supporting members, said shaping means comprising a holding member and a plurality of templets mounted between said holding member and said belt, said templets being spaced longitudinally and transversely of said belt and being movable transversely of said belt.

10. A finishing machine comprising an elongated frame provided with pulleys at the two ends thereof and supporting means placed substantially symmetrically with reference to said pulleys, said shaping means being carried by said supporting members, and belt tightening means carried by said

supporting members, said belt tightening means being symmetrically mounted with reference to said supporting members, said shaping means comprising a holding member and a plurality of templets mounted between said holding member and said belt, said templets being spaced longitudinally and transversely of said belt, resilient means being provided between said holding member and said templets to permit action of certain of said templets transversely of said belt independently of the action of other of said templets.

Signed at Chicago, Illinois, this 11th day of February, 1922.

ANTON F. BORCHERS.