

Feb. 10, 1942.

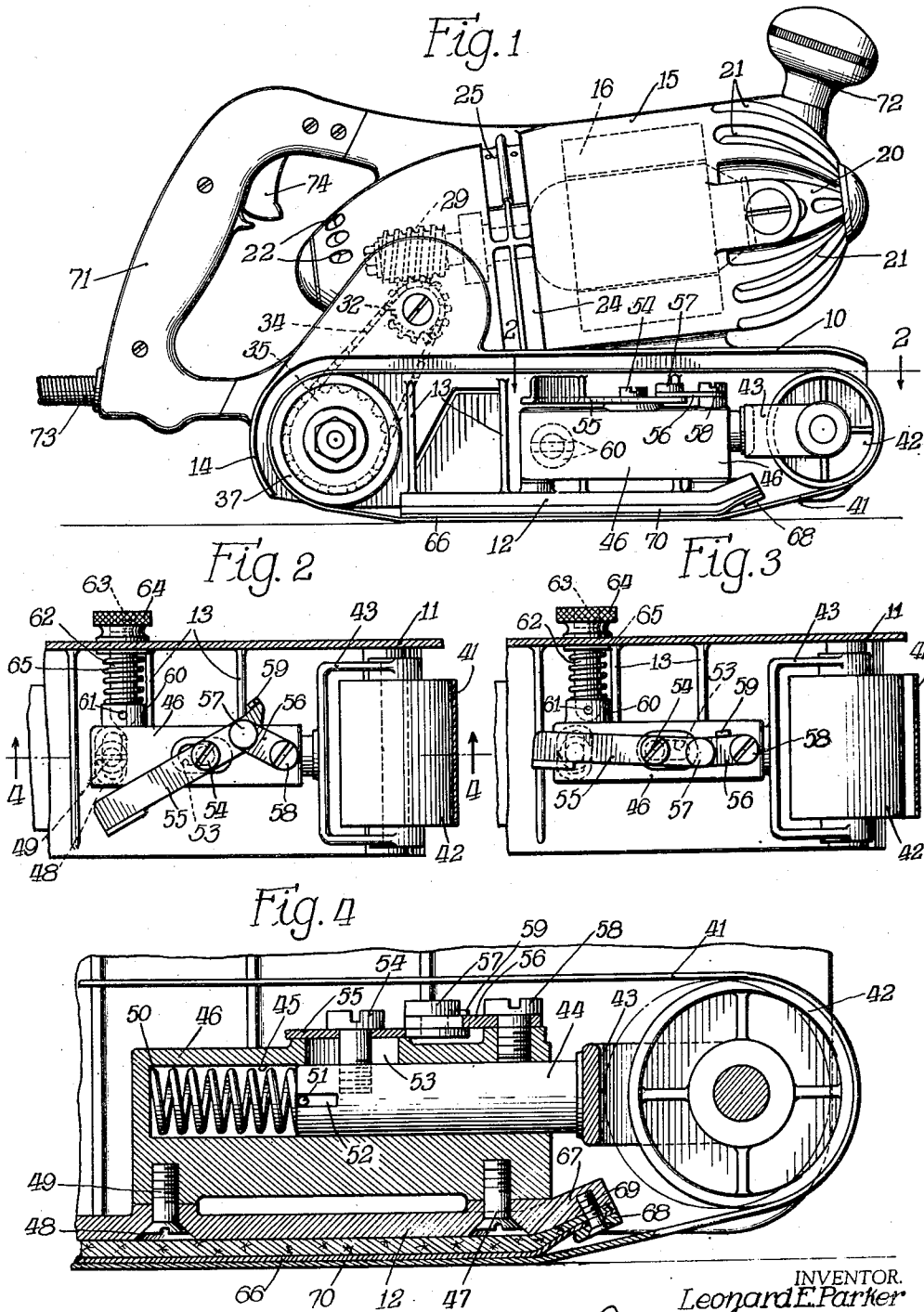
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2,272,273

SANDING MACHINE

Filed Jan. 5, 1940

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 5

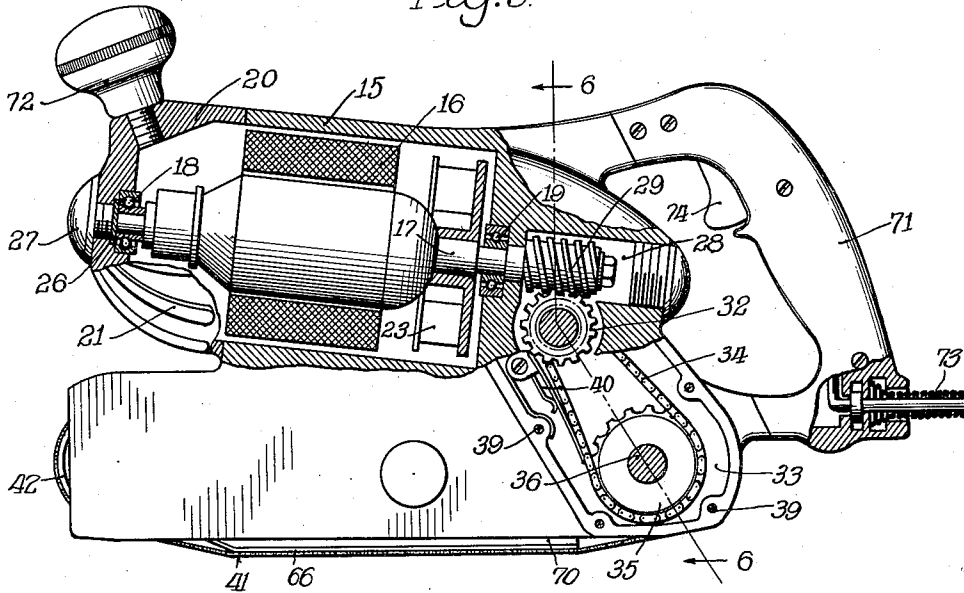
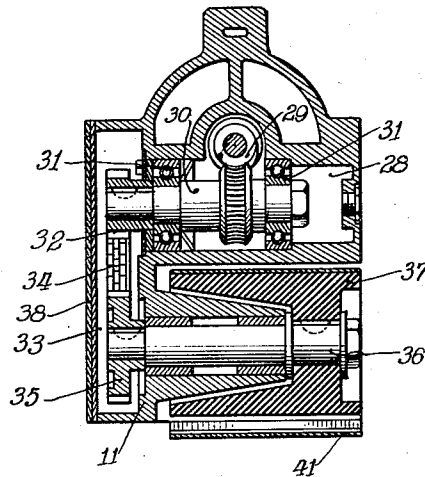


Fig. 6



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UNITED STATES PATENT OFFICE

2,272,273

SANDING MACHINE

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Application January 5, 1940, Serial No. 312,454

3 Claims. (Cl. 51-170)

This invention relates to wood-working machines of the portable type, and more particularly is concerned with machines for sanding purposes.

The main and primary object of the invention is to provide a machine of the character referred to having novel and efficient means for tensioning the sanding belt and removing the tension therefrom when such is required. A machine so constructed permits ready access to the sandpaper for replacement of the same when it has become worn and incapable of further use, and the sandpaper likewise is subjected to the required degree of tension to render it capable of serving its purpose to the highest degree.

A further object of the invention is the provision of simple and efficient means for freeing the sandpaper belt of the tension to which it is subjected, and thus enabling easy replacing of the sandpaper when such is required.

Furthermore, the invention seeks to provide a sandpapering machine wherein the tensioning means referred to may be expeditiously adjusted to effect the tensioning and non-tensioning of the sandpaper belt. The latter, therefore, may be quickly removed when impaired, and replaced by another belt, with the expenditure of but a minimum amount of time in making the replacement.

The invention also has in contemplation the provision of a sandpapering machine designed and adapted for maintaining proper feed and travel of the sandpaper belt. In the event the action of the belt becomes impaired the invention also includes means for restoring the same to proper operating condition so that the belt becomes freed from its impairment, and its proper subsequent operation is insured.

Having these and other objects of like import in view, the invention consists substantially in the novel construction, combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and finally pointed out in the appended claims.

While the form of the invention herein shown and described is believed to be a preferred embodiment thereof, it is to be understood that the same is susceptible to changes in the form, proportion and minor details of construction, and the right is, therefore, reserved to resort to such changes without departing from the spirit or scope of the invention.

In the drawings

Fig. 1 is a side elevation of a sanding machine constructed in accordance with the present invention;

Fig. 2 is a fragmentary sectional plan view on the line 2-2, Fig. 1, the front supporting roll and its adjusting means being illustrated as when the roll is distended;

Fig. 3 is a view similar to Fig. 2, the movable parts occupying the position which they assume when retracted;

Fig. 4 is a longitudinal sectional view as on the line 4-4, Fig. 2, the parts being illustrated on an enlarged scale;

Fig. 5 is a central longitudinal sectional view of the herein described machine taken through the motor chamber and illustrating the connecting gearing between the motor and the driving roll, the position of the sanding machine being reversed to that illustrated in Figs. 1 to 4, inclusive;

Fig. 6 is a vertical transverse sectional view as on the line 6-6, Fig. 5.

Referring in detail to the accompanying drawings, the numeral 10 designates the sustaining deck of the herein described sander which constitutes the support for the operative parts of the machine, as well as the casing which houses the driving motor and the gearing for transmitting motion therefrom to the driving and supporting rolls. The sustaining deck 10 generally is substantially flat, being disposed horizontally, and at its rear edge it has a depending vertical supporting plate 11 at the lower edge of which is arranged an inwardly-extended flat supporting shoe 12. This shoe is sustained in rigid parallel position with reference to the deck 10 by means of a series of stays 13 that extend in angular relation between the deck 10 and the shoe 12.

The rear end of the sustaining deck 10 has a transverse depending curved guard 14 the lower edge of which terminates above the surface on which the sander rests, as clearly seen in Fig. 1, and thus the rear end is free from contact with such surface.

Arranged above the sustaining deck 10, and disposed in inclined relation thereto, is a motor casing 15 of generally cylindrical form, which casing extends longitudinally of the deck 10. Within the casing 15 is located an electric motor 16 of any suitable construction and type adapted for the purposes of the present machine, the armature shaft 17 of said motor being sustained by and operating in front and rear ball bearings 18 and 19 respectively. The front bearing 18 is positioned within a supporting head 20 that may be detachably connected to the casing 15, and

said head 20 has a plurality of longitudinally-extending slots 21 formed therein for the admission and circulation of air for cooling the motor 16. The rear bearing 19 receives the rear end of the armature shaft 17 and sustains the latter in proper operative position.

At the rear end of the casing the latter is provided with a series of openings 22 for the entrance of air that may be entrained within the casing by a suitable fan 23 carried by the armature shaft 17 and interposed between the armature and the rear ball bearing 19. The motor casing 15 has a grated opening 24 that surrounds the fan 23, said opening being provided with covering plates 25 that extend over the upper portion of the opening 24 and by which the latter is partially closed to protect the fan against damage by the admission of extraneous substances other than the air.

The front ball bearing 18 is in communication with a lubricant chamber 26 that is closed by a removable screw plug 27.

Within the rear end of the motor casing 15, and extending transversely thereof, a gear chamber 28 is formed, a worm gearing 29 being located therein and affording driving connection between the armature shaft 17 of the motor 16 and a transverse shaft 30. This shaft is mounted in spaced ball bearings 31 fitted within the gear chamber 28, and said shaft 30 is provided with a pinion 32 that is fitted to the projecting end of that shaft. This pinion 32 is located within a gear housing 33 which is arranged at the rear side of the motor casing 15 and projects at that side. A driving chain 34 is associated with the pinion 32, which chain also traverses a pinion 35, preferably of greater diameter than the pinion 32, which pinion 35 is mounted on the shaft 36 of a driving roll 37. The shaft 36 passes through the vertical supporting plate 11, and said driving roll 37 is fastened to the shaft 36 in any desired manner in order that the roll may operate with said shaft.

The gear housing 33 has a cover plate 38, and this is detachably secured to the housing through the medium of a series of fastening screws 39.

That the driving chain 34 may be properly tensioned in its operation a spring-actuated contact finger 40 is mounted within the housing 33 and yieldingly bears against one stretch of the chain 34, as clearly illustrated in Fig. 5.

The driving roll 37 fits beneath the supporting deck 10 in proximity to the guard 14 thereof, and said roll is actuated from the motor 16 through the medium of the worm gearing 29 and the chain 34 that is engaged with the pinions 32 and 35. Preferably, the driving roll 37 is formed of rubber so as to have a tenacious engagement with an endless sandpaper belt 41, which belt operates over the driving roll 37 and also a supporting roll 42 that is journaled in a U-shaped supporting fork 43. This fork 43 has a rearwardly-extending cylindrical guide stem 44 that is received by an elongated cylindrical bore 45 formed within a guide block 46. The guide block 46 is mounted upon the supporting shoe 12, being held for pivoted movement on said shoe by a fastening screw 47. This permits the guide block 46 to be swung laterally with respect to the shoe 12, as occasion may require, in order to determine the proper engagement of the supporting roll 42 with the sandpaper belt 41, and thus maintain proper alignment of the roll and the sandpaper.

The shoe 12 is also provided with a trans-

verse arcuate slot 48 in which a fastening screw 49 is loosely received, the screw 49 being engaged with the end of the guide block 46 that is most remote from the point of engagement of the pivotal screw 47 with the guide block. By reason of this slotted engagement, the screw 49 serves to guide the lateral swinging movement of the guide block 46, and to maintain the latter in proper horizontal position on the shoe 12.

Within the cylindrical bore 45 is located a coil spring 50 which seats against the closed end of said bore. The opposite end of said spring 50 is designed to contact the end of the guide stem and, when this stem is forced outwardly, a stop 51, which is in the form of a transverse pin spanning the cylindrical bore 45, horizontally thereof and having its ends fixed in the guide block. The pin 51 is received by a slot 52 that is formed transversely of the inner end of the guide stem 44. By reason of the pin 51 fitting within the slot 52 as indicated, the pin 51 holds the guide stem 44 against rotation, and maintains the supporting roll 42 also against horizontal deflection so as to prevent deflection of the endless belt 41.

The guide block 46, at its upper side, has an elongated slot 53 formed therein. This slot receives a fastening screw 54 that is detachably engaged with the guide stem 44, the screw 54 being capable of free sliding movement lengthwise of the slot 53. The screw 54 is carried by an actuating lever 55 which may freely swing upon said screw 54. Also pivotally connected to one end of the lever 55 is a link 56, a headed stud 57 serving to connect the link 56 and the lever 55. The link 56 also is connected to a fastening screw 58 which is threaded into the guide block 46 at the end thereof adjacent to the fork 43.

Through the medium of the actuating lever 55 forward and backward movement of the supporting roll 42 may be effected in order to apply tension on the belt 41 and to release the belt from such tension. Thus, in the position of the parts illustrated in Fig. 2, tension of the spring 50 is exerted against the guide stem 44 to force the same outwardly, and thereby to tension the sandpaper belt 41. As the parts are illustrated in Fig. 3, however, the spring 50 is compressed, and the fork 43 with its guide stem 44 is retracted so that the belt 41 is not under tension. In such position the belt 41 readily may be removed from the rolls 37 and 42, either for replacement by a new belt, or for such other purposes as may render desirable such removal.

With the parts positioned as in Fig. 2, the relative straightening of the actuating lever 55 and the link 56 causes the fastening screw 54 to move along the slot 53 against the pressure of the spring 50 exerted against the guide stem 44. This retracts the supporting roll 42 and loosens the belt 41, as indicated. It will be noted, however, from Fig. 3 that in the position of the actuating lever 55 and the link 56 the screw 57 has been swung slightly beyond the dead center point so that the lever 55 and the link 56 are not in direct alignment. This locks these parts against further movement, and this position is maintained by an upstanding contact finger 59 carried by the actuating lever 55 and designed to engage the edge of the link 56, as illustrated in Fig. 3. This precludes reverse movement of the lever 55 until sufficient pressure has been applied thereto to swing the contact finger 59 backwardly away from the link 56.

For the purpose of swinging the guide block

46 on the pivotal screw 47, and thus to cause the roll 42 squarely to engage the sandpaper belt 41, the guide block 46 is provided with a pair of spaced ears 60, and pivotally connected between said ears 60, as at 61, is a guide shank 62. This is provided with a screw-threaded extremity 63 on which is mounted an adjusting nut 64 that bears against the outside of the vertical supporting plate 11, the shank 62 passing loosely through the supporting plate 11. Interposed between the latter and the ears 60, and surrounding the shank 62, is a coil spring 65 which offers resistance to the action of the adjusting nut 64 when the latter is tightened. The movement, therefore, of the guide block 46 is cushioned by the spring 65, and the latter imparts elastic resistance to the movement of the guide block when the nut 64 is tightened. As above indicated, the engagement of the stop pin 51 with the slot 52 holds the shank 44 against rotation, and maintains the proper presentation of the supporting roll 42 to the sandpaper belt 41. Proper feed and travel of the sandpaper belt 41, therefore, can be maintained. Should a square contact of the face of the supporting roll 42 with the belt 41 be not had, rotation of the nut 64 in either direction will cause movement of the guide shank 62 inwardly or outwardly, with a correspondingly swinging of the roll 42 in either direction. Thus, a square engagement of the face of the roll 62 with the belt 41 may be had, thereby insuring proper feed and travel of the sandpaper belt 41, and preventing its deflection towards either end of the roll 42 as the sandpaper passes over the roll.

To insure the proper distention of the lower reach of the sandpaper belt 41 towards the surface being treated, a pressure plate 66 is arranged next adjacent to and in contact with such lower reach. The forward end of the shoe 12 is deflected upwardly, as more clearly shown in Fig. 4, to provide an anchoring lip 67 the forward end of the pressure plate 66 likewise being deflected upwardly and secured to said lip 67 by means of a clamping strip 68 and a plurality of holding screws 69 that pass through the strip 68 and engage the lip 67. Interposed between the pressure plate 66 and the shoe 12, with its forward end held to the lip 67 by the plate 66, the clamping strip 68 and the screws 69, is a cushion pad 70 that may be formed of cork or similar material. The rear edges of the pressure plate 66 and the cushion pad 70 are free from engagement with the rear edge of the shoe 12. Being anchored to the deflected lip 67 at their forward edges the plate 66 and the pad 70 act to spring away from the shoe 12 at their rear edges, and when the lower reach of the sandpaper belt 41 is positioned over the plate 66 and the pad 70 such springing action will tension the lower reach of the belt 41. This will distend such lower reach of the belt 41 and maintain the same taut so as properly to engage the surface that is to be smoothed by the sandpaper.

For the convenient manipulation of the herein described sander the latter is provided with a handle loop 71 suitably connected at its upper end to the motor casing 15 and at its lower end to the transverse curved guard 14. A handle knob 72 is detachably connected to the forward end of the motor casing 15.

A suitable cable 73, containing the requisite conductors for supplying the motor 16 with the necessary electrical energy for its operation, enters the handle loop 71, being connected to a switch 74 of approved design for controlling the

operation of the motor 16. These elements form no part of the present invention and require no further description as to their form and construction.

With the parts described as above, and assembled in the manner shown, it will be understood that upon the actuation of the switch 74, the cable 73 being connected to a suitable source of electrical energy, the motor 16 will be set in operation. Through the worm gearing 29, the shaft 30, and the interposed gearing 32, 34 and 35, motion will be transmitted to the driving roll 37. The sandpaper belt 41 being trained around the driving roll 37 and the supporting roll 42, will be actuated and travel of the same about the rolls 37 and 42 maintained. With the supporting roll 42 and its immediate contiguous parts positioned as shown in Fig. 2, the roll 42 will be projected forwardly or outwardly and the sandpaper belt 41 thereby placed under tension. This is the operative position of the machine. As it continues, the presentation of the sandpaper belt 41, being urged outwardly by the pressure plate 66 and the pad 70 to the surface being treated, will cause the surface to be cut away and smoothed, and this will continue so long as the machine is in operation. It is assumed that in this operation the supporting roll 42 is adjusted to present its surface squarely to the sandpaper belt 41 and thereby present the latter in the same manner to the work. If, however, a deflection of the roll 42 has arisen so that the surface thereof is presented at an angle to the face of the work instead of a square presentation of such surface, such condition may be met and easily remedied by proper manipulation of the nut 64 to swing the guide block 46 either forwardly or backwardly on its pivot 47.

Should it be desired to remove or replace the sandpaper belt 41 the actuating lever 55 and the link 56 are positioned as illustrated in Fig. 3. When so positioned the guide stem 44 is retracted against the pressure of the spring 50 and the supporting roll 42 thereby moved towards the guide block 46. The sandpaper belt 41 thus becomes slack and may be removed freely from the rolls 37 and 42. When so removed a further belt may be substituted for the one displaced. Thereupon, the actuating lever 55 and the link 56 are positioned as illustrated in Fig. 2, with a resultant tensioning of the belt for further cutting.

It will be observed that in the movement of the roll 42 the anchorage of the link 56 to the fixed fastening screw 58 effects the longitudinal movement of the fastening screw 54 and the connected guide stem 44. The latter, therefore, moves backwardly and forwardly according to the straightening or breaking of the alignment of the actuating lever 55 and the link 56.

I claim:

1. In a sanding machine, the combination with a sustaining frame, a driving roll carried thereby, and means for operating said driving roll, of a supporting roll associated with said sustaining frame and movable relatively to said driving roll, an endless abrasive belt trained over said rolls, means for moving the supporting roll in relation to the driving roll to maintain the abrasive belt in distended position, and manually operable toggle mechanism, for retracting the supporting roll to a fixed position to loosen the abrasive belt and free the latter from its distended position.

2. In a sanding machine, the combination with

a sustaining frame, a driving roll carried thereby and arranged at one end thereof, and means for operating said driving roll, of a supporting roll associated with said sustaining frame and disposed at its opposite end, said supporting roll being movable relatively to said driving roll, an endless abrasive belt trained over said rolls, means arranged between said driving and supporting rolls and operatively related to the supporting roll to maintain the abrasive belt in distended position, and means including a toggle joint for retracting the supporting roll and locking it in retracted position to loosen the abrasive belt and free the latter from its distended position.

3. In a sanding machine, the combination with a sustaining frame, a driving roll carried thereby,

and means for operating said driving roll, of a supporting roll associated with said sustaining frame and movable relatively to said driving roll, an endless abrasive belt trained over said rolls, a guide block interposed between said driving and supporting rolls and provided with a bore, a sliding support for said supporting roll mounted in said bore, an actuating lever mounted on said guide block and connected with said sliding support, a link connected to said actuating lever and also to said guide block, said actuating lever and said link when moved into substantial alignment serving to lock the supporting roll against outward movement, whereby to release said endless abrasive belt from tension.

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