March 9, 1943. T. E. MEAD 2,313,254

SANDING DEVICE

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Fig. 1.

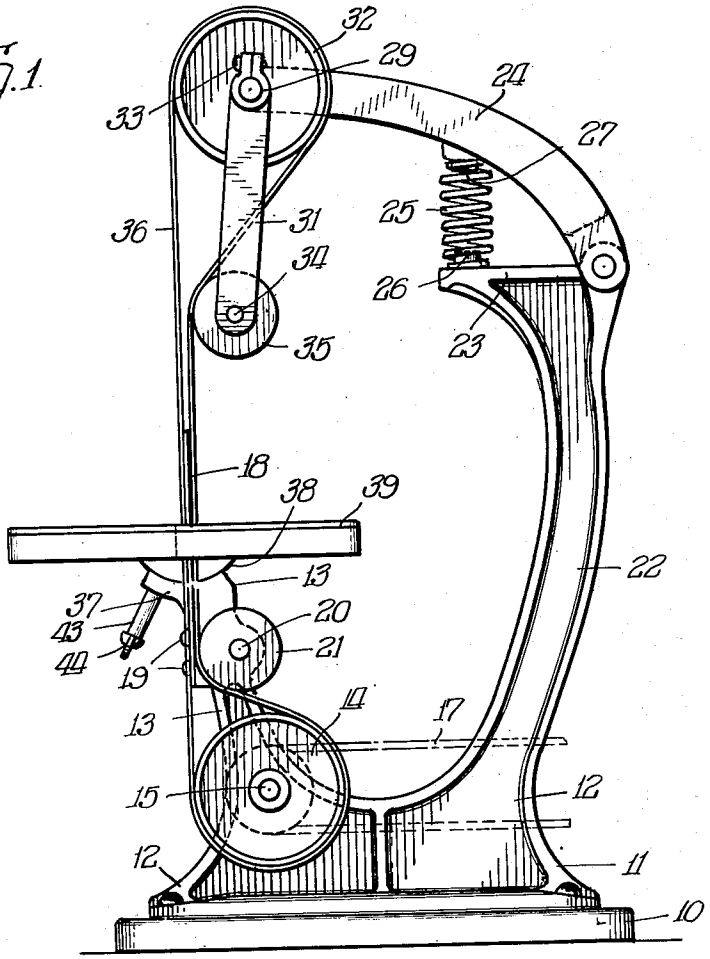
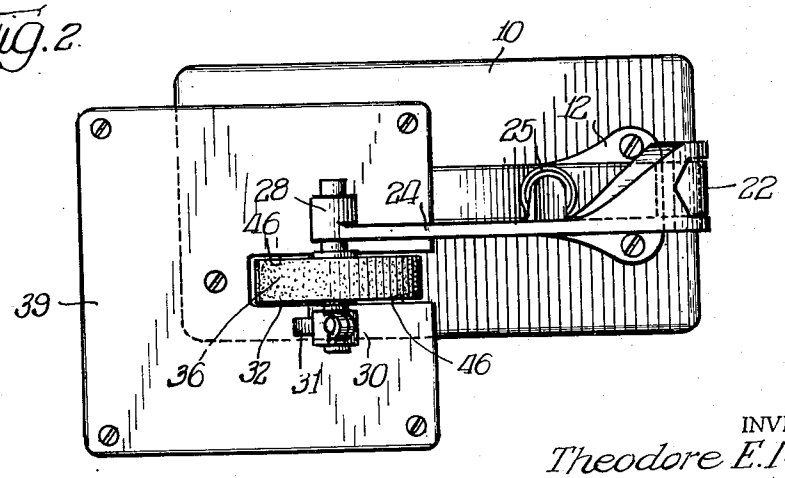


Fig. 2.



INVENTOR.
Theodore E. Mead,
BY
Dawson, Owens & Booth,
Attys.

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Fig. 3.

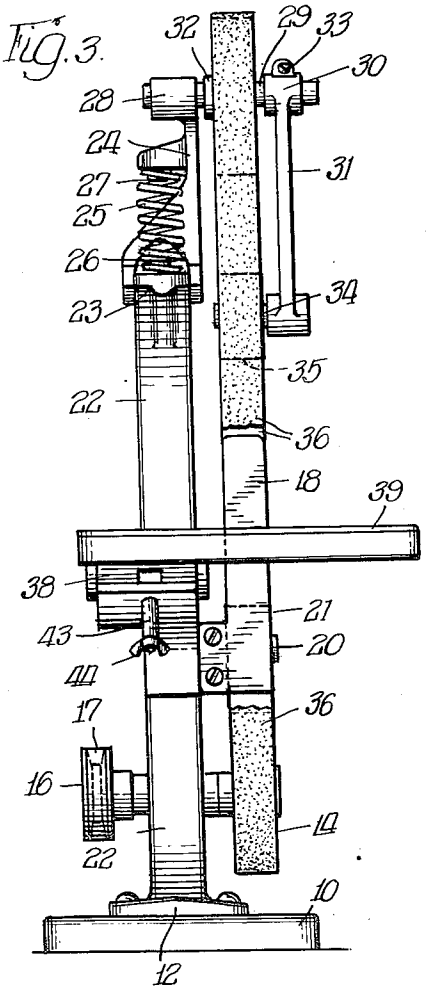


Fig. 4

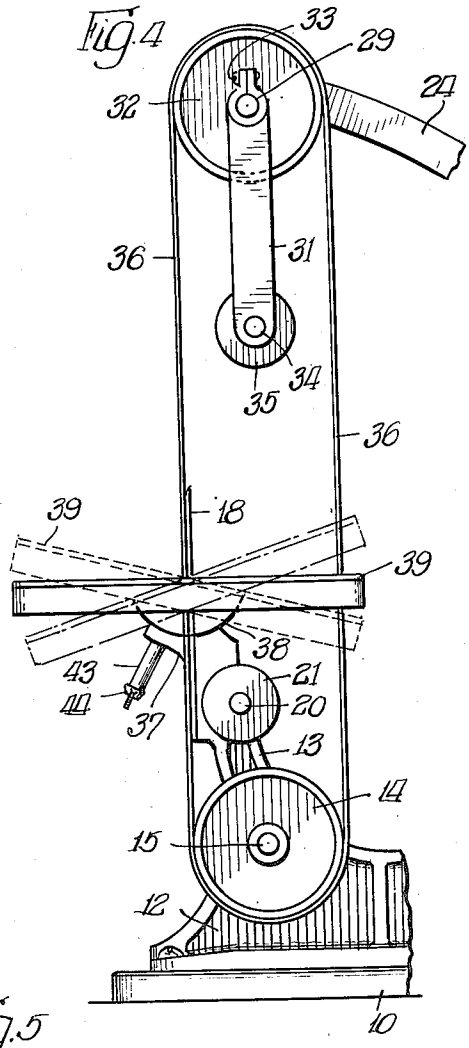
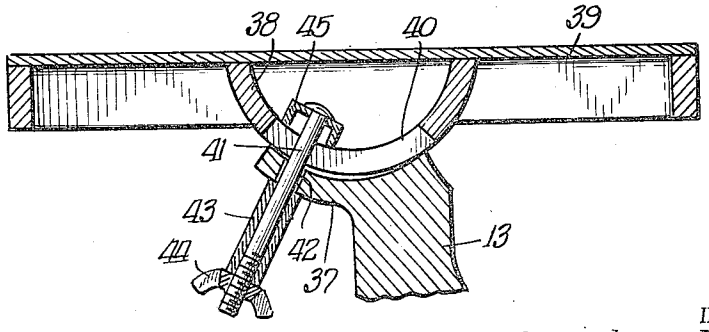


Fig. 5



INVENTOR.
Theodore E. Mead,
BY Dawson, Doms & Booth,
Attys

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UNITED STATES PATENT OFFICE

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SANDING DEVICE

Theodore E. Mead, Chicago, Ill.

Application April 2, 1941, Serial No. 386,419

8 Claims. (Cl. 51—135)

This invention relates to a sanding device. It will be understood, however, that the invention described is applicable to other uses.

An object of the invention is to provide a sanding device of extremely simple structure which is utilized for new functions and which may be readily converted from one type of device into a different type of structure, accomplishing different functions. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in a preferred embodiment, by the accompanying drawings, in which—

Figure 1 is a side view in elevation of apparatus embodying my invention; Fig. 2, a top plan view; Fig. 3, a front view in elevation; Fig. 4, a broken detail view showing the driving belt in separated position; and Fig. 5, a broken enlarged detail view of the means for supporting the work-holder or table.

In the illustration given, 10 designates a support which may be of any suitable type or structure. Upon the support 10 is a base member 11 secured to the support 10 by screws 12. It will be understood that the base 11 may be secured directly to a floor or to any other suitable surface. The base 11 has integrally formed therewith a bracket member 13 which supports a drive pulley 14 mounted upon shaft 15. The shaft 15 extends through the bracket and carries a small pulley 16 which is driven by belt 17 leading from any suitable driven part (not shown). The bracket 13 also carries a back-stop or belt support member 18 which is secured by screws 19 to the bracket. The bracket member also supports a shaft 20 carrying idler pulley 21.

Also carried by the base 11 is a vertically extending standard 22 having at its top a shelf portion 23. Pivotally secured to the top of standard 22 is a pulley supporting arm 24. Arm 24 is normally urged in an upward direction by an expansion spring 25 held at its ends between lug 26 carried by the shelf portion 23 of standard 22, and held at its upper portion by the lug 27 carried by the arm 24.

The arm 24 is provided at its upper end with a bearing member 28 receiving the shaft 29. The shaft is tightly received within the bearing 28 and locked therein by a screw. The opposite end of the shaft is secured to a split bearing 30 carried by a roller arm 31. Between the members 28 and 30 is supported a belt roller 32. The split bearing 30 is provided with a pair of ears which are drawn toward each other by a screw 33. By this means, the arm 31 is frictionally secured upon fixed shaft 29. The lower end of the arm 31 is provided with a horizontal shaft 34 carrying the idler roller 35.

A belt 36 having a sand or abrasive surface on its exterior is normally supported upon the two rollers 14 and 32.

The work-holder may be supported in any desired manner. In the illustration given, the bracket member 13 is provided at its top portion with an arcuate seat 37 receiving a hollow curved bearing member 38 which is an integral part of the work-holder 39. The part cylindrical member 38, as shown more clearly in Fig. 3, is provided with a slot 40 through which extends a bolt 41. The bolt also extends through an opening 42 in the arcuate seat member 37. A sleeve 43 is received over the bolt 41 on the outer end portion thereof, and a wing nut 44 is employed to exert pressure against the sleeve and thus draw the longitudinally-extending angle iron head 45, engaged by the head of the bolt, firmly against the member 38. In this very simple manner, the work-holder is supported in the desired positions upon the bracket seat 37. In Figure 4, I have illustrated some of the positions through which the work-holder may be readily moved.

The work-holder 39 is provided with a slot 46 wide enough to receive the belt 36 and permitting the parallel belt portions to be swung toward each other to the central portion of the work-holder.

Operation

In the operation of the device, the belt 36 is ordinarily employed in the position shown in Fig. 4. In this position, the drive comes through pulley 16 and thence through drive roller 14, the work-support 39 being swung to the desired position upon the loosening of wing nut 44 and, when in the desired position, fixed thereon by tightening the nut 44.

It is often desired to sand the inner edges of an opening within a piece of work. In order to transform the present device so as to permit sanding of the edge portions of the opening, it is only necessary to depress lever arm 24 so as to free the belt 36 and then extend the end of the belt through the opening in the work and thread it about the rollers 20, 35 and 32, as illustrated in Fig. 1. This operation takes a brief instant. It will be noted that the slot 46 within the work-holder 39 permits the inner portion of the belt to be swung toward the outer portion of the belt, as shown in Fig. 1. It is often desirable to take off the belt originally used and

substitute for it one which is longer and which more readily fits the new configuration illustrated in Fig. 1. The belt can be slipped off in a brief instant by depressing arm 24 and drawing the belt off of the pulleys 32 and 14. After the new belt has been run through the opening in the work, it can be drawn about the pulleys 14, 20 and 32, and the arm 31 can be swung to the position shown in Fig. 1, the friction upon the shaft 29 being sufficient to maintain the arm 31 in the position to which it is pressed. In the position shown in Fig. 1, in which one parallel portion of the belt is urged into an adjacent position to the other, the sanding operation can be carried on very effectively within a circular or other shaped opening in a piece of work and an effective sanding operation about the edges of the opening accomplished. To change the machine back to its initial position, it is only necessary to depress arm 24, remove the belt from the pulleys, and place on another belt, as shown in Fig. 4, or without removing the belt from rollers 32 and 14, the belt may be slipped laterally off rollers 20 and 34, the spring 25 taking up the slack. Here, the pulleys 21 and 35 are supported out of engagement with the sanding belt 36.

The pivot arm 24 is not only useful in permitting relative movement of the pulleys 14 and 32 to facilitate the removal of the sanding belt, but it also serves as a constant support for maintaining the belt in taut position. The yielding support also serves as a means for protecting the mechanism against unusual strains.

The work-holder 39 may be shifted readily into any of the desired positions, no matter whether the device be used as shown in Fig. 1 or as shown in Fig. 4, the slot 46 in the holder permitting movement of the belt members toward and away from each other.

While the seat for the member 38 may be of any suitable curvature, I prefer a slightly dished seat, deeper in the center than at the edges, so that the rounded portion of the member 38 will engage the seat at the four corners of the seat, thus providing a four-corner support for the part cylindrical member 38. This results in a very tight joint, while at the same time permitting ready adjustment.

While the invention has been described in connection with a sanding belt, it will be understood that the belt may be equipped with cutting means or work means of other types for effecting changes upon the work carried by the holder.

While in the foregoing description, I have set forth certain specific structure and certain details as a part of the mechanism, it will be understood that wide variation in such details may be made without departing from the spirit of my invention.

I claim:

1. In apparatus of the class set forth, a base, a bracket carried thereby, a standard on said base, a pivotally-mounted arm carried by said standard, aligned pulleys carried by said bracket and said arm, resilient means urging said arm in an upward direction, a work-effecting belt on said pulleys, and means carried by said arm for engaging a portion of said belt between said pulleys and for pressing one parallel portion of said belt toward the other to bring the portions into closely adjacent back-to-back relation with respect to each other.

2. In apparatus of the class set forth, a base, a bracket carried thereby, a standard on said base, aligned pulleys carried by said bracket and standard, an endless work-effecting belt on said pulleys, said belt having parallel portions in adjacent relation, a work-holder supported adjacent said belt and provided with a slot receiving the parallel portions of said belt, said slot being of a depth much greater than the thickness of said parallel portions whereby said portions may be moved toward and away from each other within said slot, and roller-equipped means for pressing one parallel portion of said belt toward the other.

3. In sanding apparatus of the class set forth, a base, a bracket carried thereby, a standard on said base, said standard having a table portion at its top, an arm pivotally supported upon said standard, a compression spring supported by the table portion of said standard and normally urging said arm upwardly, a pulley carried by said arm, a sanding belt about said pulleys, and roller-equipped means pivotally carried by said arm for normally maintaining the parallel portions of said belt in adjacent relation to each other.

4. In work-effecting apparatus, a base, a bracket carried thereby, said bracket being provided with a dished top surface, a part cylindrical member received within said seat and engaging only the corner portions thereof, said member being part of a work-holder, said work-holder closing the upper portion of said part cylindrical member, said part cylindrical member having a slot therein, a bolt extending through said slot, a crosshead engaged by said bolt and bearing against said cylindrical member, said bolt extending through an opening in said bracket member and having a threaded outer portion, a sleeve about said threaded portion, and a nut engaging said threaded portion of said bolt and adapted to exert pressure against said sleeve to lock said work-holder in position upon said bracket.

5. In sanding apparatus of the class set forth, a base, a bracket carried thereby, a standard on said base, aligned pulleys carried by said bracket and standard, a continuous sanding belt on said pulleys, said bracket providing at its upper end an arcuate seat, a work-holder equipped with a part cylindrical base of greater radius than said arcuate seat and received within the corners of said seat, said work-holder having a slot receiving said belt, and means extending into said part cylindrical member and through an opening in said seat member for releasably locking said work-holder in a plurality of positions

6. In apparatus of the class set forth, a base, a bracket carried thereby, a standard on said base, aligned pulleys carried by said bracket and said standard, a work-effecting belt on said pulleys, a work-holder supported adjacent said belt and provided with a slot receiving the same, means for adjusting the position of said work-holder, and means for engaging the belt on opposite sides of the work-holder and between the pulleys to bring parallel portions of said belt into closely adjacent back-to-back relation with each other.

7. In apparatus of the class set forth, a base, a bracket carried thereby, a standard on said base, a pulley arm movably supported on said standard, pulleys carried by said arm and said bracket, an endless work-effecting belt on said pulleys, said belt having parallel portions in adjacent relation, a work-holder carried by said bracket and provided with a slot receiving said belt, said slot being of a depth much greater than

the combined thickness of said parallel portions of the belt whereby said portions may be moved toward and away from each other within said slot, and means for engaging the belt on opposite sides of the work-holder and between the pulleys to bring the parallel portions of the belt into closely adjacent back-to-back relation with each other.

8. In sanding apparatus of the class set forth, a base, a bracket carried thereby, a standard on said base, an arm pivotally mounted upon said standard, spring means normally urging said arm upwardly, pulleys carried by said arm and said bracket, a continuous sanding belt on said pulleys, said belt having parallel portions in adjacent relation, a work-holder supported by said bracket and provided with a slot receiving said belt, said slot being of a depth much greater than the combined thickness of said parallel portions of the sanding belt whereby said portions may be moved toward and away from each other within the slot, roller-equipped means for engaging the belt between the work-holder and one pulley to press one parallel portion of said belt toward the other, and roller-equipped means for engaging the belt between the work-holder and the other pulley to maintain the parallel portions of the belt in closely adjacent back-to-back relation with respect to each other.

THEODORE E. MEAD.