Dec. 20, 1955 T. GRONNING 2,727,338

BELT SANDER FOR SPIRAL CONVEYER ROLLS

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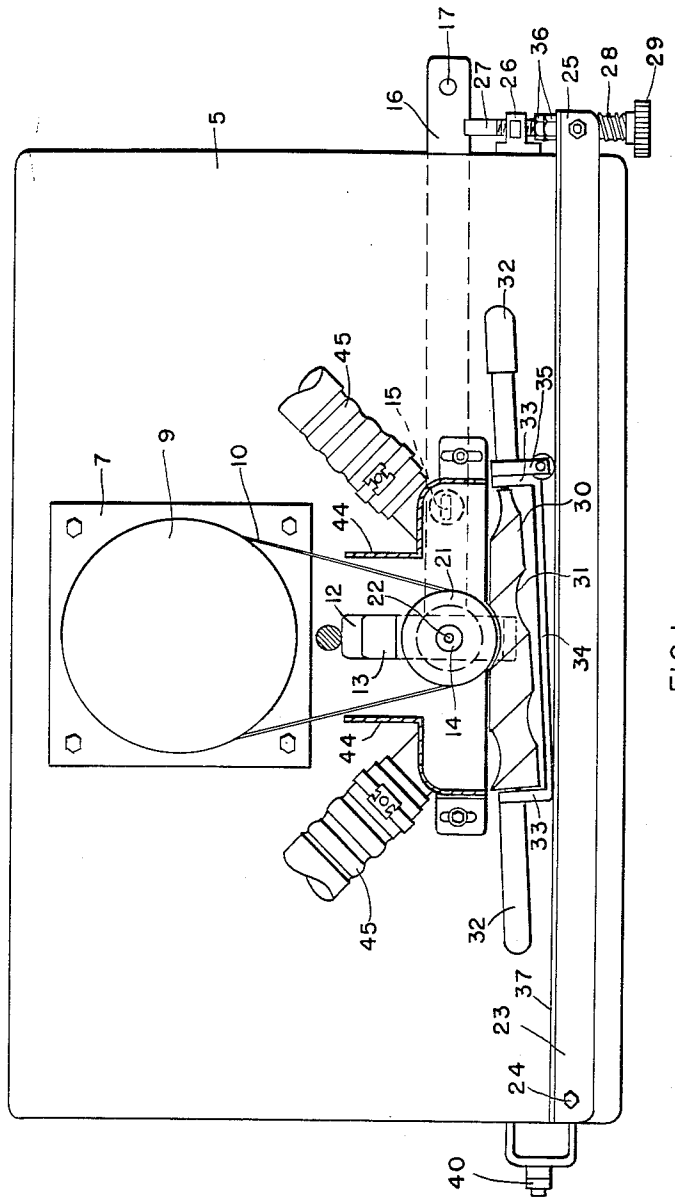


FIG. 1

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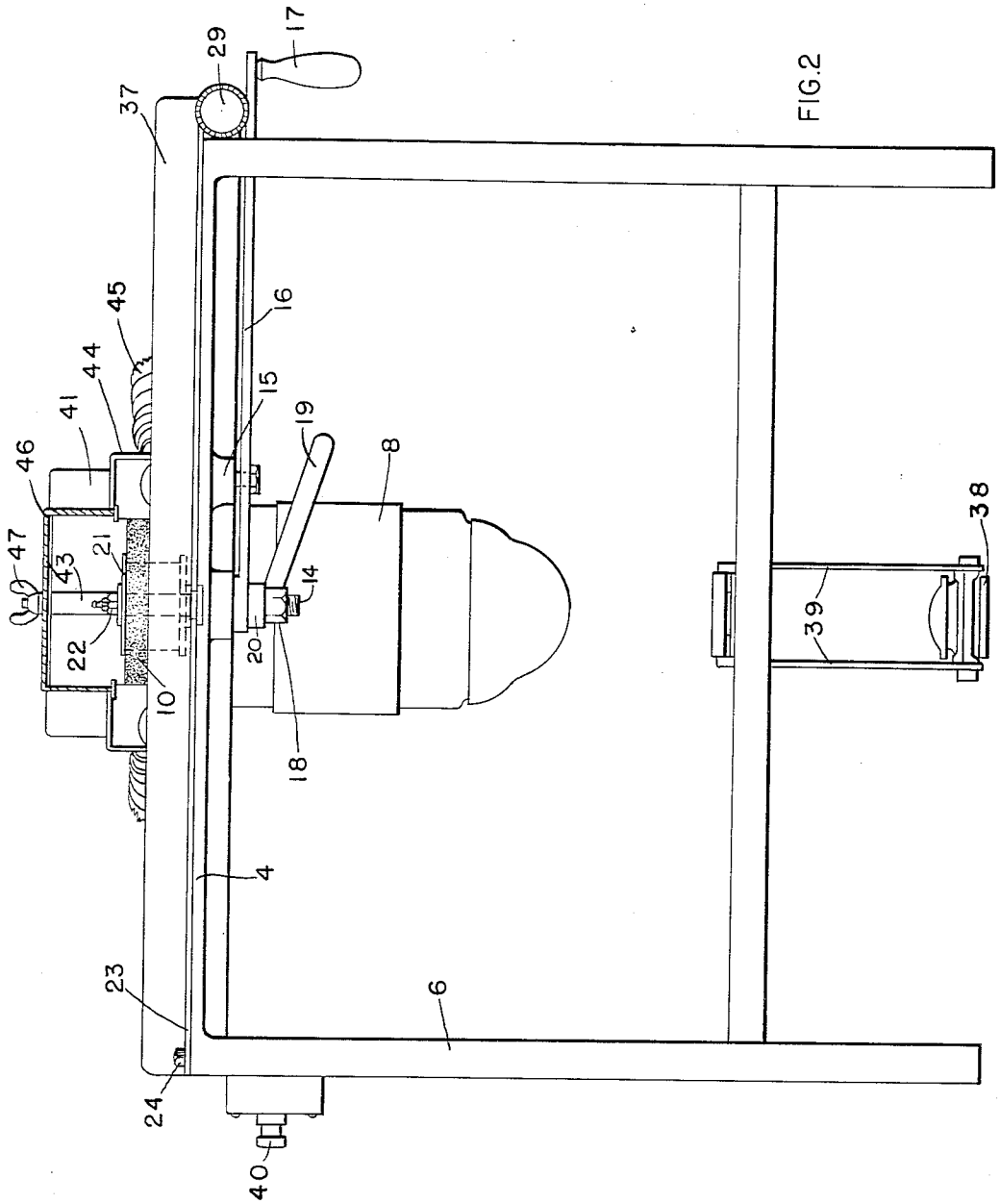
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FIG.2



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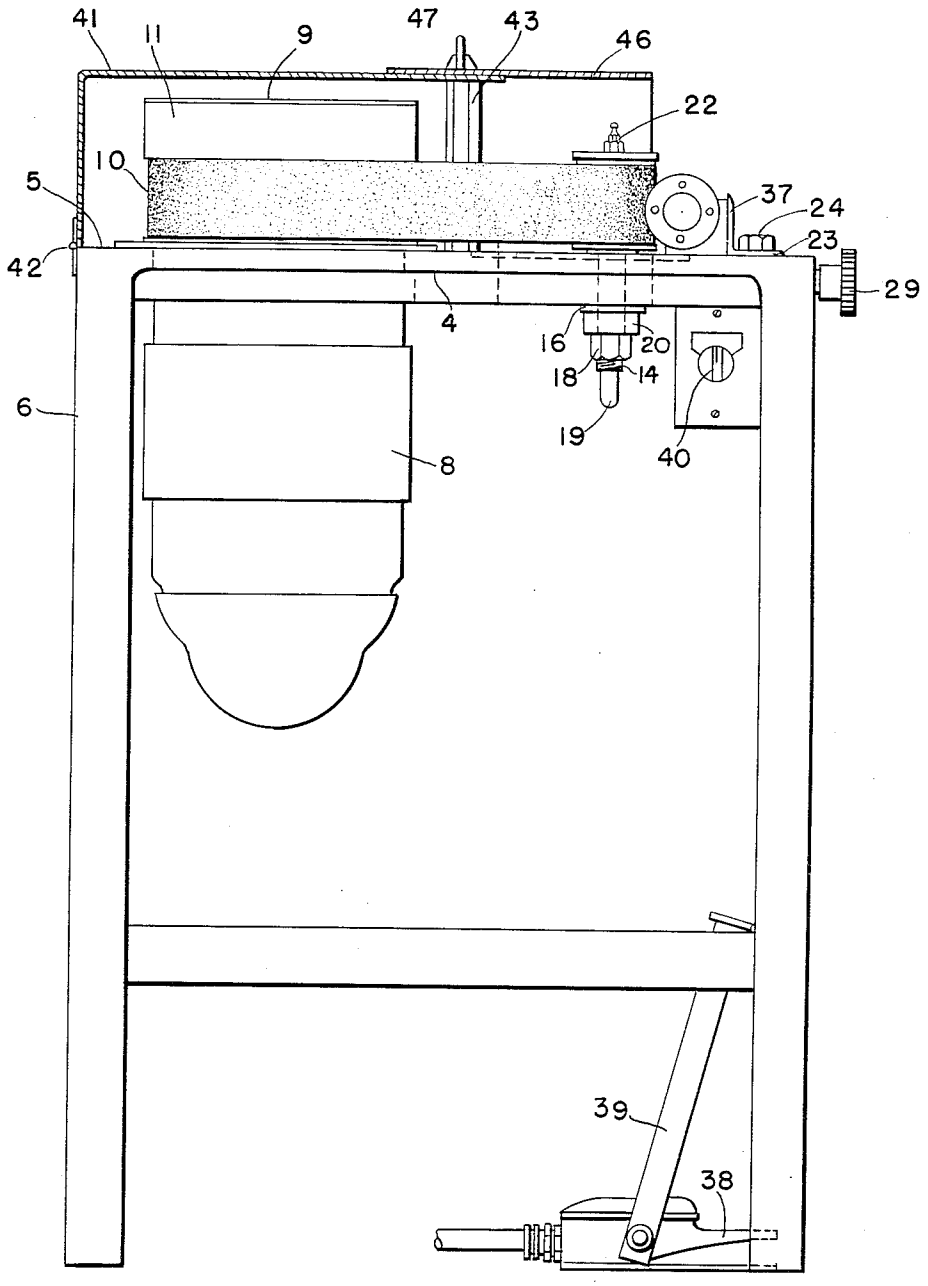


FIG.3

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United States Patent Office

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BELT SANDER FOR SPIRAL CONVEYER ROLLS

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Application January 5, 1954, Serial No. 402,208

6 Claims. (Cl. 51—144)

The following specification relates to novel improvements in a belt sander for spiral conveyer rolls and the like. In the can handling industries, cans are fed to and from work stations by means of rotating spiral conveyer rolls. These rolls have concave spiral recesses suitably proportioned to fit partially around the cylindrical side walls of the cans and advance them individually. The proper and efficient engagement with the individual cans and advancing them depends upon having the spiral concavities evenly spaced from the axis of the roll and suitably concave in longitudinal cross-section. That is, the root diameter of the spiral should be at a constant distance from the axis of the roll or on an even taper thereto.

It has been found that the spiral concavities or can engaging tracks can most effectively be produced by grinding along lines which are comparable to the cylindrical surface of the cans which it is intended to feed.

One of the objects of my invention is to provide a sanding machine by which the concave spiral of the feed roll can be ground true.

Another object of my invention is to provide a work holder which can be manipulated to feed the work into the desired engagement with the sanding element.

A further object of the invention is to provide a sanding machine which may be adjusted to sanding spiral feed rolls of various desired sizes.

Among the objects of my invention is to provide means for giving a desired taper to the spiral of a feed roll.

The objects of my invention also include the provision of guide means which will withdraw the work from the grinding device where the stresses become excessive.

In like manner the invention includes the provision of suitable housing and facilities for the control and disposal of dust produced in the sanding or grinding operation.

The invention is best illustrated in its preferred form on the accompanying drawings in which

Fig. 1 is a plan view of the improved belt sander with the covers removed;

Fig. 2 is a front elevation, and

Fig. 3 is an end elevation of the same.

The novel device consists of an endless belt sander directly driven by a motor and providing a sanding surface which conforms to the cylindrical contour of the cans for which the spiral feed roll is intended. The sanding belt is mounted on a rotating pulley which is adjusted in position to give appropriate tension and then locked into position. A work holder for the spiral feed roll is provided. This is advanced against the sanding belt so that the spiral concavity is ground into a cross section conforming to the side wall of the can. In this operation, the work holder is held up to the sanding belt by a guide rail which in turn may be released under abnormal operating conditions. Finally the dust produced in the sanding operation is removed from the area around the work.

In the drawings I have shown a table 4. This includes a cast metal top 5, supported on a frame 6.

The top 5 has an opening over which a supporting plate 7 is bolted. A motor 8 is suspended beneath the supporting plate 7 with its shaft projecting vertically through the plate and above the top of the table. The shaft of the motor carries a drive pulley 9. This is preferably of wood or other like material which does not store energy of rotation to such an extent as would result in coasting after the motor stops.

The pulley 9 is of considerable width. It is adapted to carry an endless sanding belt 10. As sanding belts of different widths are required to finish the spiral drive rolls of different sizes of cans, the pulley has a maximum width to accommodate the largest sanding belt. When a belt of less width is used, a spacing collar 11 is fitted tightly around the upper portion of the pulley 9.

The top of the table is slotted transversely, as shown at 12 on Fig. 1, along a line which is perpendicular toward the front end of the table and radial with respect to the drive pulley 9. This slotted portion 12 forms a track along which a bearing plate 13 and shaft 14 are movable from front to rear.

The vertical, fixed shaft 14 is mounted in the bearing plate 13 and extends both above and below the top of the table.

A boss 15 is formed integrally beneath the top of the table and at the right of the slot 12. This boss forms a fulcrum for a lever 16. The short end of the lever has an elongated hole fitting over the fixed shaft 14 below the top of the table. The other end of the lever is extended beyond the end of the table top and there provided with a handle 17.

The lower end of the fixed shaft 14 below the lever 16 is threaded to receive a nut 18 which has an operating handle 19. The shaft 14 is provided with a spacing collar 20 between lever 16 and nut 18. The nut may be locked against the collar 20 and lever 16, clamping the latter against the lower surface of the table top and thus locking the bearing plate 13 in adjusted position.

The fixed shaft 14 at its upper end carries a driven pulley 21 which has a metal bushing in contact with the fixed shaft. Lubrication for the bushing on the fixed shaft 14 is provided centrally of the shaft by means of the nipple 22.

Both pulleys have frictional outer surfaces made of rubber gasket material, or the like.

A guide rail 23 is pivoted on bolt 24 at the left end of the top of the table. The guide rail has a vertical flange 37 on its inner edge. The rail 23 extends beyond the right end of the table where it is provided with a depending, apertured end 25.

This end of the table is provided with a screw-threaded block 26 in the same plane with the apertured end 25.

An adjustment screw 27 passes through the apertured depending end 25 and is screw-threaded into the block 26. Two nuts 36, 36 are tightened together on the screw 27 to form an adjustable stop against which the depending end 25 rests.

In front of the end 25 the screw 27 is provided with a helical compression spring 28. A hand wheel 29 forms the end of the screw 27, so that the spring 28 rests against the hand wheel and maintains compression against the depending end 25 holding the latter against the nuts 36, 36.

The conveyer roll is shown at 30 on Fig. 1 to include a helix 31. This helix or spiral must be trued by the sanding belt so that its cross-section on the longitudinal axis will conform to the side wall of the can of selected dimension. The conveyer roll 30 is provided with op-

erating handles **32, 32**, axially at each end. These handles are held in the ends **33, 33** of a carriage **34**.

Where it is desired to provide a suitable taper for the rolls, one end of the carriage **34** is provided with a plate **35** having a roll which rests against the front flange **37** of the guide rail **23**, the adjustment of the roll determining the degree of taper.

As the work requires that the operator use both hands in holding it, the operation of the motor is made dependent upon an operating foot switch **38**. This switch **38** is mounted between parallel links **39, 39**, hinged to the frame and lowered to the floor for foot operation. When desired, the links may be raised so that the foot switch is out of working or operating position.

A reversing switch **40** is provided at the left end of the frame. In this manner the motor **8** may be put in operation by the foot switch in either direction, determined by the reversing switch.

Suitable housing is provided over and around the sanding belt and both pulleys. A hood **41** is hinged at the back at **42** and extends up and over the drive pulley **9**, enclosing it on both sides as well. A post **43** extends upwardly from the table in front of the drive pulley **9** and passes through the front of the hood.

Dust guards **44, 44** are screwed on to the table top on each side of the driven pulley **21** and can be adjusted from front to back, as shown in Fig. 1. Suction ducts **45, 45** lead out from the guards **44, 44** and are connected by suitable means to a source of suction.

A cover **46** is provided over the dust guards **44, 44**. This cover is open in front but has a top that extends back and over the front of the hood **41**, as shown in Fig. 3. A wing-nut **47** serves to hold down the hood **41** and the cover **46** on the end of the post **43**.

Dependent upon the diameter of the can or other cylinder to be transferred by the conveyer rolls, either a narrow or wide sanding belt will be selected. A narrow sanding belt three inches wide is used for cans of smaller diameter. This will do for cans having dimensions of sizes **202** to **404**. A five inch belt is required for larger spirals suitable for larger cans.

The width of the driven pulley **21** is thus determined. In like manner, the length of the fixed shaft **14** and the spacing collar **11** are also dependent upon the width of the sanding belt.

The screw **27** admits of a fine adjustment. The provision of the safety arrangement enables the operator to back the work piece quickly away from the belt when sanding high spots, or when the belt is slipping.

An adjustable taper attachment is provided at the end of the carriage so that the root of the spiral can be adjusted. For larger spirals, a separate carriage with a fixed taper can be provided. By manual feeding of the work piece, from 0.015" to 0.030" of material can be removed in a single operation. As the area of contact with the belt becomes greater, less feed can be applied. The sanding belt can also be used on flat surfaces.

It will readily be understood that with the sanding belt in operation, the carriage will advance the spiral roll with the belt in contact with the spiral groove. The roll is advanced from right to left, being gradually rotated by the handles provided. This will produce any desired taper or even parallelism, if it is desired. Any undue tension on the belt or work will be relieved by the spiral spring **28**.

The operation of the motor is under control constantly by means of the foot pedal and switch. Reversing the belt can be effected by use of the reversing switch.

While the invention has been illustrated and described by way of example, it may be embodied in structures having different sizes, proportions and materials. For this reason the invention is to be limited only in scope by the following claims.

What I claim is:

1. In combination, a table having a mounting portion, a motor suspended from said portion, a driving pulley on the motor shaft above the table, a bearing plate adjustable on the table to and from the driving pulley, a driven pulley rotatably carried on the bearing plate, an endless sanding belt on said pulleys, a guide rail on the table opposite the driven pulley and in a plane perpendicular to the axis of the pulley, and a work-holding carriage movable along the table between the driven pulley and the guide rail.

2. In combination, a table having a mounting portion, a motor suspended from said portion, a driving pulley on the motor shaft above the table, a bearing plate adjustable on the table to and from the driving pulley, a driven pulley rotatably carried on the bearing plate, an endless sanding belt on said pulleys, a guide rail on the table opposite the driven pulley and in a plane perpendicular to the axis of the pulley, said rail being pivoted at one end to the table and held adjustably and resiliently at its other end, and a work-holding carriage movable along the table between the driven pulley and the guide rail.

3. In combination, a table having a mounting portion, a motor suspended from said portion, a driving pulley on the motor shaft above the table, a bearing plate slidable in the table top to and from the driving pulley, a lever for moving the bearing plate, a clamp for locking the bearing plate and lever to the table top, a fixed vertical shaft on the bearing plate, a driven pulley rotatably mounted on the fixed shaft, an endless sanding belt on said pulleys, a guide rail on the table opposite the driven pulley, said rail being pivoted at one end to the table and held adjustably and resiliently at its other end, and a work-holding carriage movable along the table between the driven pulley and the guide rail.

4. In combination, a table having a mounting portion, a motor suspended from said portion, a driving pulley on the motor shaft above the table, a bearing plate slidable in the table top to and from the driving pulley, a fixed vertical shaft extending through the bearing plate, a lever pivoted below the table top and having one end intersected by the lower portion of the vertical shaft, a nut screw-threaded on said portion of the shaft for clamping the bearing plate and lever to the table top, a driven pulley rotatably mounted on the fixed shaft, an endless sanding belt on said pulleys, a guide rail on the table opposite the driven pulley, said rail being pivoted at one end to the table and held adjustably and resiliently at its other end, and a work-holding carriage movable along the table between the driven pulley and the guide rail.

5. In combination, a table having a mounting portion, a motor suspended from said portion, a driving pulley on the motor shaft above the table, a bearing plate adjustable on the table to and from the driving pulley, a driven pulley rotatably carried on the bearing plate, an endless sanding belt on said pulleys, a guide rail on the table opposite the driven pulley and in a plane perpendicular to the axis of the pulley, and a work-holding carriage movable along the table between the driven pulley and the guide rail, said carriage having a roller at one end to adjust the inclination of the axis of the work piece to the line of travel past the sanding belt.

6. In combination, a table having a mounting portion, a motor suspended from said portion, a driving pulley on the motor shaft above the table, a bearing plate slidable in the table top to and from the driving pulley, a lever for moving the bearing plate, a clamp for locking the bearing plate and lever to the table top, a fixed vertical shaft on the bearing plate, a driven pulley rotatably mounted on the fixed shaft, an endless sanding belt on said pulleys, a guide rail pivoted at one end on the table top opposite the driven pulley, a resilient adjustable holder for the opposite end of the rail, a work-holding carriage slidable along the table between the driven pulley and the guide rail, dust guards lateral-

ly disposed on opposite sides of the sanding belt, suction pipes leading from said guards, a hood over the driving pulley and belt, a cover over the dust guards and driven pulley, and a foot-operated switch for the motor.

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