May 26, 1936. K. L. HERRMANN 2,041,764

FEEDING DEVICE FOR GRINDERS

Filed April 30, 1934 2 Sheets-Sheet 1

Fig. 1

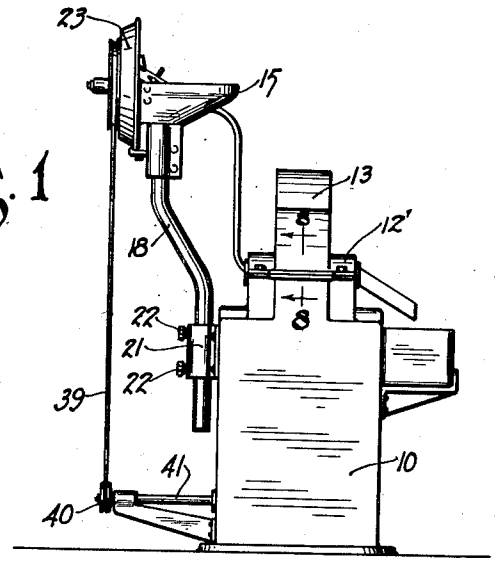


Fig. 2

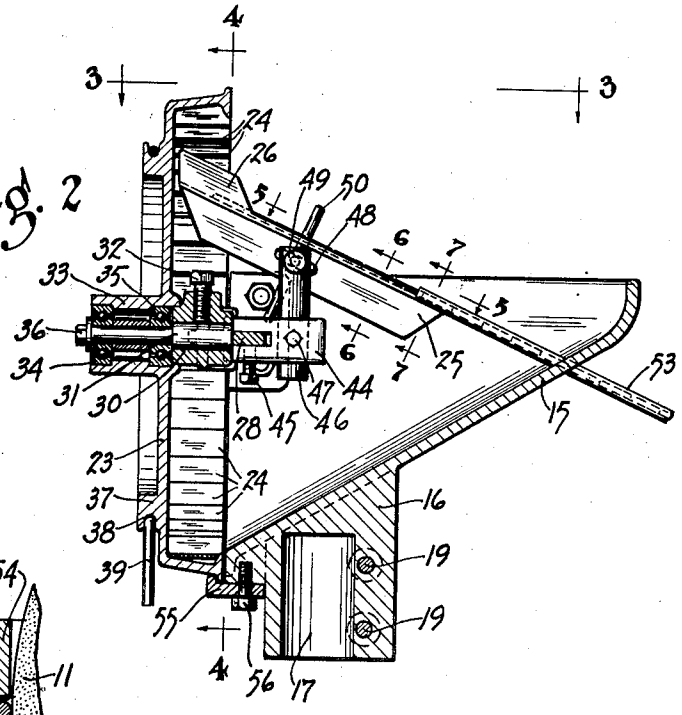
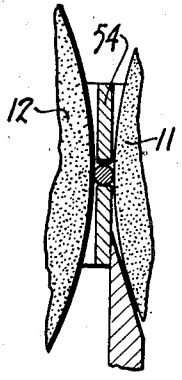


Fig. 8



INVENTOR.
Karl L. Herrmann
BY
ATTORNEY.

May 26, 1936. K. L. HERRMANN 2,041,764

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Fig. 3

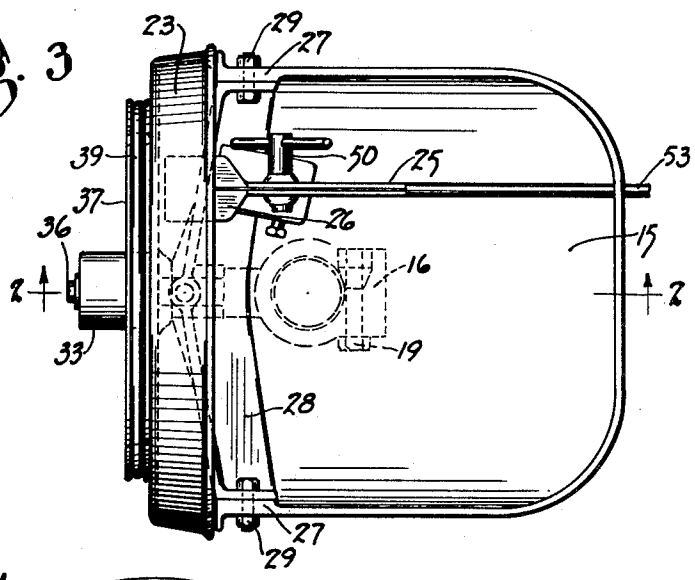


Fig. 4

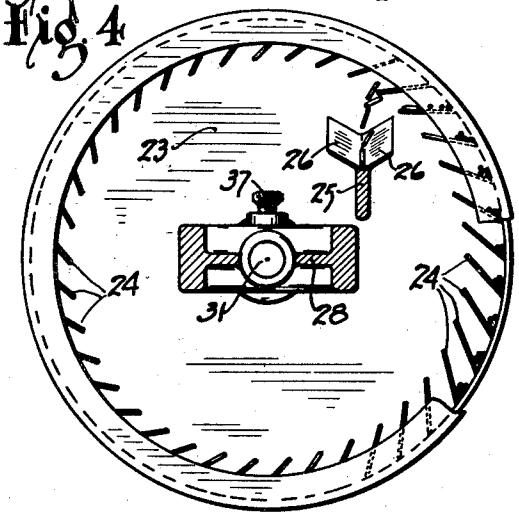




Fig. 6

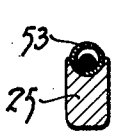


Fig. 7

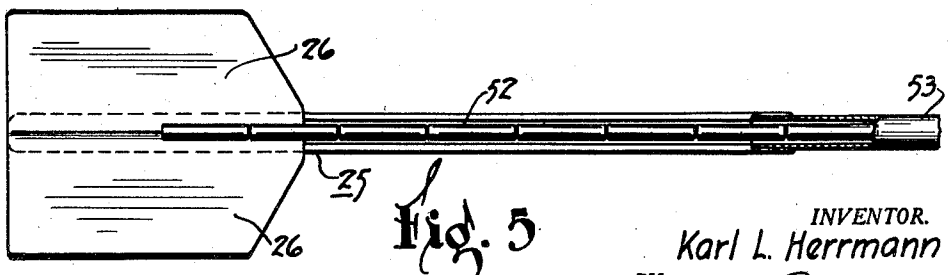


Fig. 5

INVENTOR.
Karl L. Herrmann
BY P. W. Pomeroy
ATTORNEY.

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UNITED STATES PATENT OFFICE

2,041,764

FEEDING DEVICE FOR GRINDERS

Karl L. Herrmann, South Bend, Ind., assignor to The Bantam Ball Bearing Company, South Bend, Ind., a corporation of Indiana

Application April 30, 1934, Serial No. 723,054

9 Claims. (Cl. 51—215)

This invention relates to feeding devices for grinding machines, such as, centerless grinders, and particularly to a device for automatically feeding a continuous series of roller blanks thereto.

The principal object of my invention is to provide means for automatically picking up roller blanks from a hopper and feeding them in a continuous stream into a trough or chute leading to a grinding machine, such as a centerless grinder.

Another object is to provide a power driven feeding device comprising, a rotatable member, such as a wheel, having vanes or fins on the inner face thereof formed to pick up roller blanks from a receptacle and deliver the blanks in a continuous stream directly into a chute leading to a grinding machine.

A further object is to provide a feeding device comprising, a rotatable member having vanes or fins attached thereto and positioned to pick up roller blanks from a receptacle and deliver the same into a V-shaped trough connected with a chute leading to a grinding machine whereby the blanks will move continuously along the feeder system without jamming or binding.

An additional object is to provide automatically operated means for feeding roller blanks to a grinding machine which will operate to feed the blanks more rapidly and accurately than by the means heretofore used.

It is also an object of the invention to provide a device of the character described which is simple and economical to construct, easy to operate, and which will not readily get out of order in use.

Other objects, and objects relating to details of construction, methods of manufacture, and means of operation, will be apparent from the detailed description to follow.

In the accompanying drawings I have illustrated the preferred mechanical embodiments of the idea of the invention; however, the drawings are to be taken as illustrative only and the scope of the invention is to be measured entirely by the scope of the appended claims.

In the drawings in which like numerals refer to like parts throughout the several views,

Fig. 1 is an elevational view of a grinding machine, such as a centerless grinder, showing a feeding attachment for roller blanks incorporating the idea of my invention attached thereto.

Fig. 2 is a detailed sectional view taken on the line 2—2 of Fig. 3, showing the feeding mechanism.

Fig. 3 is a top plan view of the feeding mechanism illustrated in Figs. 1 and 2.

Fig. 4 is a detailed sectional view taken on the line 4—4 of Fig. 2, showing the rotatable member for delivering roller blanks into a feeder trough.

Fig. 5 is a plan view looking in the direction of the arrows on the line 5—5 of Fig. 2, showing the feeder line for delivering roller blanks to the grinding machine.

Fig. 6 is a detailed sectional view taken on the line 6—6 of Fig. 2.

Fig. 7 is a detailed sectional view taken on the line 7—7 of Fig. 2.

Fig. 8 is a detailed sectional view taken on the line 8—8 of Fig. 1, showing a portion of the grinding wheels and the roller blank supporting device therebetween.

Since roller bearings of the type known in the trade as "quill roller" bearings have come into common commercial use, various attempts have been made to finish such rollers cheaply and accurately; however, heretofore it has not been possible or practical to deliver the roller blanks in a continuous stream rapidly enough to equal the capacity of the grinding machine, such as a centerless grinder. After numerous experiments, I have developed a feeding device which will deliver the roller blanks in a continuous stream to the grinding machine accurately and rapidly whereby the production of the machine has been materially increased, thus diminishing labor costs and enabling me to increase the production of finished rollers at reduced expense.

Referring to the drawings in detail and particularly to Figs. 1 and 8, I have illustrated a grinding machine, such as a centerless grinder, which has a base 10 on which is supported spaced grinding wheels 11 and 12 rotatable in opposite directions, the same being mounted on suitable shafts supported in bearings, one of which is indicated at 12'. The grinding wheels 11 and 12 may be encased in a housing 13 if desired.

The roller blank receiving receptacle or hopper 15 may have a split support 16 formed thereon which is drilled at 17 to receive a shaft or support 18 rigidly secured therein by the locking bolts 19, as is best illustrated by dotted lines in Fig. 3. Attached to the side of the base 10 is an apertured bracket 21 adapted to receive the support 18 as shown in Fig. 1, and locked therein by the locking screws 22. As illustrated, the elevation of the hopper 15 may be adjusted relative to the base 10 by moving the support 18 up or down relative to the bracket 21 and then fixed in the desired position by tightening the locking screws

22. Although I have shown the hopper as supported directly by the grinding machine, if desired, the same may be supported by a separate framework and the feeding mechanism presently to be described may be driven independently of the grinding machine.

Referring particularly to Figs. 2 and 3, the hopper 15 is preferably formed so that the roller blanks roll or slide to the left-hand end thereof to be picked up by a feeding mechanism comprising a disk-shaped wheel or flanged disk 23 on the inner face of which are attached a plurality of fins or vanes 24 positioned at the proper angle to deliver the roller blanks picked up from the hopper 15 into a trough 25 having wings 26 formed to provide a V-shaped receiving member.

The hopper 15 is formed to provide flanged faces 27 at opposite sides thereof against which are positioned a strut or support 28 secured thereto by the bolts 29. The strut 28 is recessed at 30 adjacent to the center thereof to receive a stub shaft 31 which preferably is locked against rotation by the lock screw 32. A hub 33 formed on wheel 23 encircles the reduced outer end of the shaft 31, a pair of ball bearings 34 and 35 being interposed therebetween to permit easy rotation of the wheel. The wheel 23 and the ball bearings 34 and 35 are maintained against longitudinal movement by the strut 28 and the nut 36 screwed into the outer end of the shaft 31.

I have shown a flange 37 formed on the exposed side face of the wheel 23 which has a groove 38 formed therein to provide a pulley adapted to receive the belt 39 which may be driven by a pulley 40 mounted on a shaft 41 suitably driven from the grinding machine, or from any other suitable source of power. Although I have shown the pulley formed directly on the wheel 23, it will be understood that other suitable driving means therefor may be provided, as for example, a pulley may be attached to the hub 33, or the flanged face of the pulley may be formed to provide the pulley. It, therefore, is to be understood that the driving means is not limited to the construction shown, as various changes and modifications may be made therein without in any way affecting the operation of my device.

A support 44 is forked to fit over the flange on the strut 28 and is clamped thereon by the lock screw 45. The member 44 is also recessed to receive a stud 46 clamped in position by the lock screw 47. The trough 25 is slotted at 48 to receive the pin 49 extending laterally from the stud 46, the latter being adapted to clamp the trough in the desired position as by the nut 50. The slot 48 in the trough 25 permits adjustment of this member laterally relative to the wheel 23 and also permits adjustment of the angle of the trough to regulate the speed at which the roller blanks will slide thereon. The trough 25 beyond the wings 26 has a V-shaped groove 52 formed therein to receive the rollers as they are delivered thereto by the wheel 23. As the trough 25 has an open face, any of the roller blanks which do not line up in end-to-end relation will fall over the side of the trough into the hopper 15 to again be picked up by the wheel 23 to be delivered to the trough. A tube or chute 53 extending through an opening formed in the hopper 15 is attached to the end of the trough 25 at its upper end in alignment with the V-shaped groove 52 so that as the roller blanks slide along the trough 25 they will enter the tube 53 and slide therealong to the grinding machine. The lower end of the tube 53 is preferably connected with or attached to the grinding machine in alignment with the slotted roller guiding plate 54 positioned between the grinding wheels 11 and 12 to thus deliver the roller blanks to the grinding wheels so that the cylindrical faces thereof may be ground.

As the wheel 23 rotates relative to the hopper 15, I preferably form the wheel and the hopper with mating faces as shown in Fig. 2 so that the roller blanks may roll or slide from the hopper 15 directly into the wheel 23 to be picked up by the fins 24 thereon. I also provide a clamp 55 which is attached to the hopper 15 by the screws 56 and which has a flanged end extending over the flanged open face of the wheel 23. One or more of the clamps 55 may be used to assist in maintaining the wheel 23 in proper alignment with the hopper 15 one such clamp being clearly illustrated.

Having described the various parts of my device, the operation of the same will now be described.

Roller blanks may be dumped into the hopper 15 whereupon they will be picked up by the fins 24 on the rotatable wheel 23 which may be driven from the grinding machine or from any other suitable source of power, the roller blanks being carried to the upper part of the hopper where they will slide off the fins 24 into the trough 25 in end-to-end relation so that they will slide as a stream along the trough 25 into the tube 53 to be delivered between the grinding wheels 11 and 12, as clearly shown in Fig. 8.

If for any reason the roller blanks fail to slide along the trough 25 in end-to-end relation or if the feeder line becomes jammed, the blanks will fall over the edges of the trough 25 back into the hopper 15 whereupon they will be again picked up by the wheel 23 and be delivered to the trough 25. It will thus be seen that I have provided an automatically operated feeding means for delivering roller blanks to a grinding machine in a continuous stream in end-to-end relation which will not require the services of an operator or need constant attention as it is necessary only to keep roller blanks in the hopper 25 to provide a continuous flow of roller blanks to the grinding machine.

While I have illustrated and described a specific mechanical embodiment of the idea of my invention, it will be understood that the invention is not specifically limited to the construction so illustrated and described but that such changes in the size, shape and arrangement of parts may be resorted to as come within the scope of the appended claims and I, therefore, desire to claim my invention broadly as well as specifically.

What I claim is:

1. In combination with a grinding machine having a pair of opposed grinding wheels and an apertured roller blank supporting plate therebetween, means for feeding roller blanks between said wheels comprising, a hopper elevated above said machine, an inclined chute having a V-shaped blank receiving portion and a V-shaped groove of less cross sectional area in the top face thereof, a wheel rotatable transversely to the longitudinal axis of said chute having fins on the inner face thereof for picking the blanks from said hopper and delivering them in end-to-end relation onto the V-shaped receiving portion of said chute, and means between said chute and grinding wheels for delivering said blanks by gravity in a continuous stream between said wheels.

2. Means for feeding roller blanks to a grind-

ing machine comprising, a roller blank receiving hopper having an inclined bottom wall elevated above said machine, a strut supported in said hopper, a dish-shaped wheel having its open face mating with the lower end of said bottom wall supported by said strut, a chute supported by said strut operatively connected with said machine, and means on the inner face of said wheel for delivering the blanks from said hopper in end-to-end relation onto said chute whereby the blanks are delivered in a continuous stream to said machine.

3. Means for feeding roller blanks to a grinding machine comprising, a roller blank receiving hopper having an open end elevated above said machine, a strut supported in said hopper, an open faced rotatable wheel forming the closure for the open end of said hopper supported by said strut, a chute having one end thereof within the open faced side of said wheel supported by said strut and operatively connected with said machine, and means on said wheel for delivering the blanks from said hopper in end-to-end relation onto said chute whereby the blanks are delivered in a continuous stream to said machine.

4. Means for delivering roller blanks to a grinding machine comprising, a roller blank receiving hopper having an open end elevated above said machine, a support secured in said hopper, a rotatable wheel having an open face mating with the open end of said hopper carried by said support, a chute having a V-shaped top face adjustably carried by said support operatively connected with said machine having an open end extending into the open face of said wheel, and means on said wheel for delivering the blanks from said hopper in end-to-end relation onto said chute whereby the blanks are delivered in a continuous stream to said machine.

5. Means for delivering roller blanks to a grinding machine comprising, a roller blank receiving hopper having an open end, a strut supported in said hopper extending across the open end thereof, an open faced wheel rotatably supported by said strut having its open face mating with the open end of said hopper, a trough having a V-shaped blank receiving portion and a V-shaped groove of less cross sectional area in the top face thereof supported by said strut and operatively connected with said machine, and means on said wheel for delivering the blanks from said hopper in end-to-end relation onto said blank receiving portion whereby the blanks are delivered endwise to said grinding machine.

6. Means for feeding roller blanks to a grinding machine comprising, a roller blank receiving hopper, a strut extending across said hopper, a chute operatively connected with said machine supported by said strut, and a wheel rotatably supported by said strut on an axis perpendicular to the latter operable to deliver the blanks from said hopper in end-to-end relation onto said chute.

7. A device for feeding roller blanks to a grinding machine comprising, a hopper for said blanks, a strut secured thereto, a trough having a V-shaped top face supported by said strut, a chute extending from said trough to said grinding machine, and rotatable means for delivering the blanks from said hopper onto said trough in end-to-end relation whereby the blanks are delivered endwise in a continuous stream to said grinding machine.

8. A device for feeding roller blanks to a grinding machine comprising, a hopper for said blanks, a strut attached thereto, a trough having a V-shaped blank receiving portion and a V-shaped groove of less cross sectional area in the top face thereof supported by said strut, a chute extending from said trough to said grinding machine, a wheel carried by said strut rotatable in a direction transversely to the longitudinal axis of said chute for delivering blanks from said hopper onto the V-shaped blank receiving portion of said trough in end-to-end relation whereby the blanks are delivered in said end-to-end relation to said grinding machine.

9. In combination with a grinding machine having a pair of opposed grinding wheels and an apertured roller blank supporting plate therebetween, means for feeding roller blanks endwise between said wheels comprising, a hopper having an inclined bottom elevated above said machine, an inclined chute sloping in the direction opposite to the slope of the bottom of said hopper, having a V-shaped groove in the top face thereof supported in said hopper, a dish-shaped rotatable wheel having means on the inner flanged face thereof delivering said blanks from the low end of said hopper in end-to-end relation directly onto the V-shaped groove in said chute, and means between said chute and grinding wheels for delivering said blanks between said wheels in a continuous stream.

KARL L. HERRMANN.