Feb. 17, 1953 G. K. WARE 2,628,459

GRINDER FOR ROLLER-SKATE WHEELS

Filed Feb. 4, 1950 2 SHEETS—SHEET 1

Fig. 1.

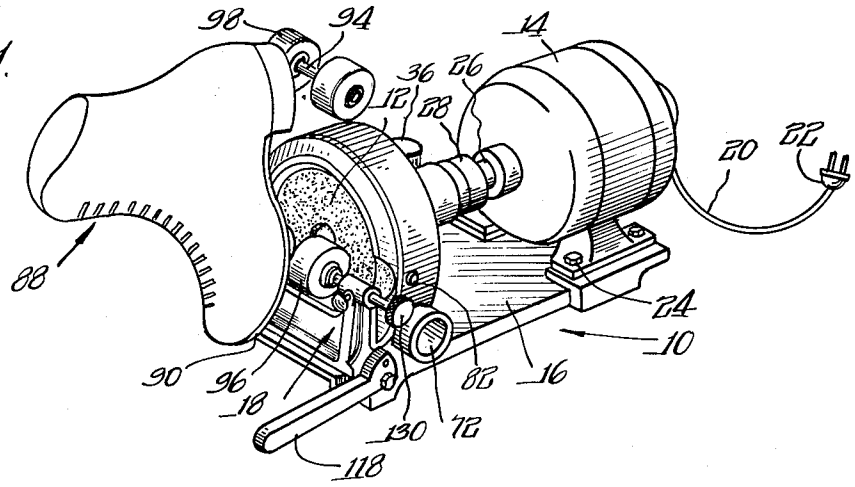

Fig. 2.

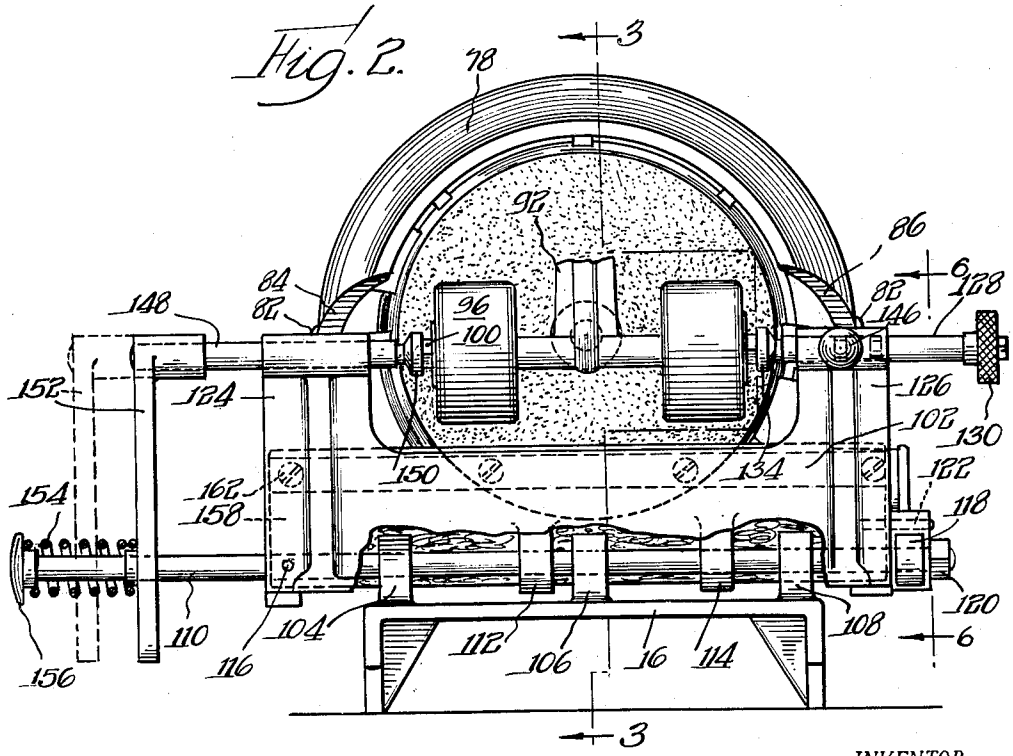

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Fig. 3.

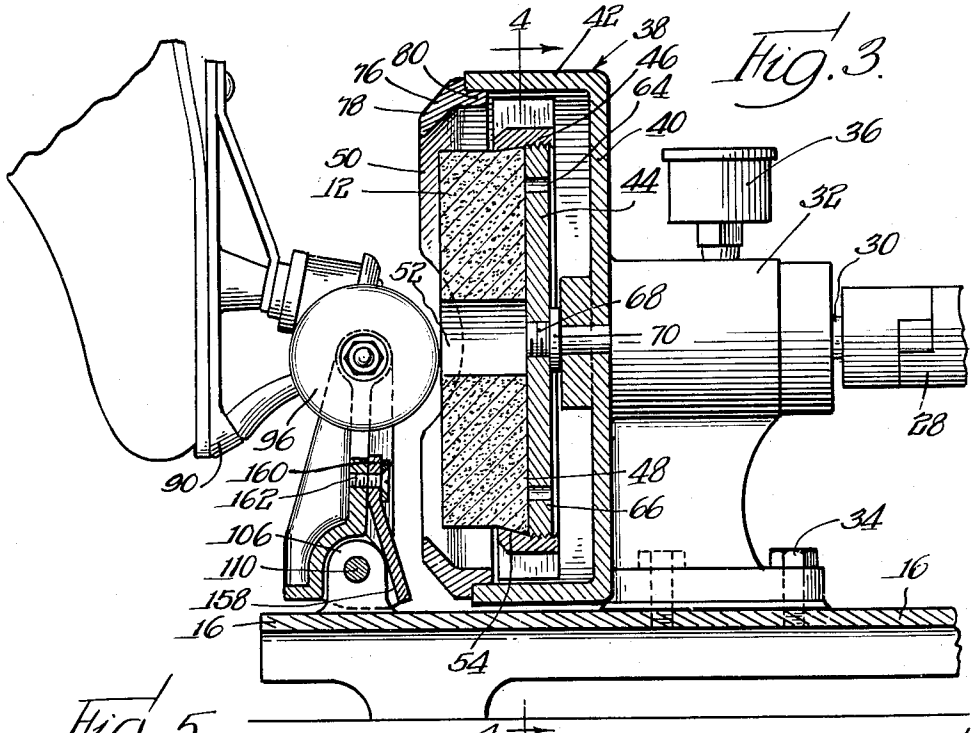


Fig. 5.

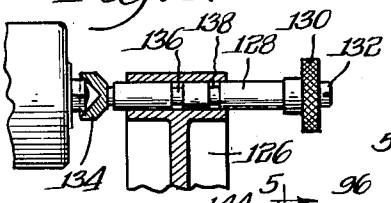


Fig. 6.

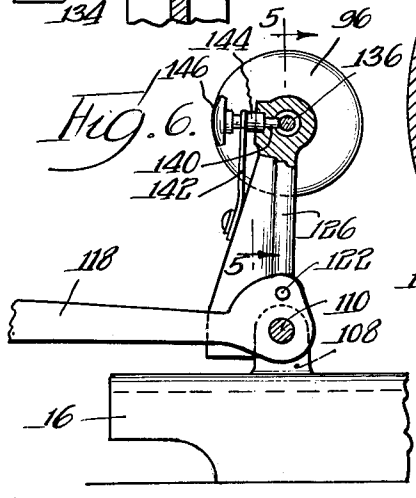
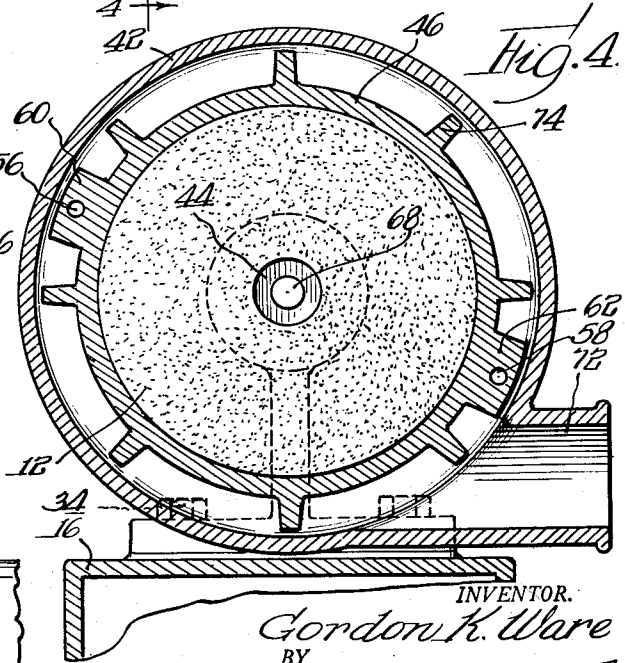


Fig. 4.



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GRINDER FOR ROLLER-SKATE WHEELS

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3 Claims. (Cl. 51—129)

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This invention relates to grinding apparatus and more particularly to grinding apparatus for grinding roller skate wheels.

Many roller skates and especially those which are intended for use on roller rinks are constructed with wheels made of wood, fibre, or similar material. Since it is the custom in rink skating to proceed in a circular course in one direction, the roller wheels tend to wear unevenly, that is one side of the wheel tends to wear more than the other. If the skater leaps into the air and lands on his skates, the surface of the roller wheel which is struck upon landing will tend to be flattened. These are merely examples of the numerous ways in which roller wheels made of the above materials can become worn and out of round. The pleasure and enjoyment to be derived from roller skating depends to a large measure upon the condition of the skate wheel and in particular its roundness and trueness.

An important object of the present invention is to provide an improved apparatus for grinding roller skate wheels.

More particularly it is an object of the invention to provide a grinder of the type described which will grind skate wheels without removing the wheels from the wheel axles.

Another object of the invention is to provide in grinders of the type described an improved structure for mounting the skate wheels upon the grinder.

Still another object of the invention is to provide in grinders of the type specified an improved means for controlling the motion of the wheels to be ground with respect to the grinding surface.

Various other objects and advantages of the apparatus will become apparent from the following specification when taken in conjunction with the accompanying drawings wherein like numerals have been used to designate like parts throughout:

Figure 1 is a perspective view of a grinding apparatus made in accordance with and embodying the principles of the present invention with a set of roller wheels shown in position upon the wheel support apparatus ready for grinding;

Figure 2 is an enlarged end view of the apparatus shown in Figure 1 with a portion of the

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skate and a portion of the grinding apparatus broken away;

Figure 3 is a partial view in cross section of the grinding apparatus substantially as seen in the direction of the arrows along the line 3—3 of Figure 2;

Figure 4 is a view in cross section of a grinding apparatus substantially as seen in the direction of the arrows along the line 4—4 of Figure 3;

Figure 5 is a view partially in cross section of the roller wheel axle clamping mechanism substantially as seen in the direction of the arrows along the line 5—5 of Figure 6; and

Figure 6 is a side view partly in cross section of the roller skate axle receiving structure substantially as seen in the direction of the arrows along the line 6—6 of Figure 2.

Referring to the drawings and particularly to Figure 1 thereof there is shown a roller skate wheel grinding apparatus made in accordance with and embodying the principles of the present invention. The grinding apparatus, generally designated by the numeral 10, comprises in general a grinding wheel 12, a motor 14 for driving the grinding wheel, a base 16 upon which the grinding wheel 12 and the motor 14 are mounted and a roller skate wheel support structure designated generally by the numeral 18.

The motor 14 is preferably an electric motor and is supplied with the necessary connecting cord 20 having a plug 22. A plurality of bolts 24 fasten the motor to the base 16. The shaft 26 of motor 14 is connected through a coupling 28 to a shaft 30 on which is mounted the grinding wheel.

Referring to Figure 3 it will be seen that shaft 30 is journalled in a bearing support member 32 that is positioned a suitable distance above the base 16 and which is fastened thereto by a plurality of bolts 34. An oil cup 36 is provided to lubricate the bearing surfaces between the shaft 30 and the bearing 32. Formed integral with and projecting from the bearing support member 32 is a grinding wheel housing 38 having a circular portion 40 disposed substantially perpendicularly to the axis of shaft 30 and a flange member 42 formed integral with and around the periphery of the circular portion 40. Flange 42 extends substantially parallel with the axis of shaft 30 and defines a circularly shaped

housing within which is disposed the grinding wheel 12.

Means is provided for attaching the grinding member 12 to shaft 30 in the form of a circular plate 44 which cooperates with a retaining ring 46. As may be best seen in Figure 3, the grinding member 12, which is preferably in the form of an emery wheel, is disk shaped and its rear face 48 has a diameter slightly greater than the front or grinding face 50. A conoidal surface is formed near the rear face 48 where the smaller diameter of the front face 50 gradually increases to the diameter of the rear face 48. Formed in the center of the grinding member 12 is a circular aperture 52 which facilitates assembly and disassembly of the parts hereinafter to be described.

The forwardly facing inner surface of ring 46 is formed as a section of a truncated cone as at 54 whereby to have a shape substantially complementary to the shape of the outer surface of the rearward portion of the grinding member 12. The rearward inner surface of ring 46 is provided with threads which cooperate with complementary threads on the outer longitudinally extending surface of plate 44. The assembly is tightened by placing a suitable tool in apertures 56—58 formed on projections 60—62, respectively, of ring 46 and another tool in a pair of apertures 64—66 formed in plate 44 and then tightening plate 44 within ring 46.

The grinding wheel mounting assembly is affixed to shaft 30 by means of screw thread engagement between the plate 44 and a threaded section 68 on the end of shaft 30. A laterally extending shoulder 70 is provided on shaft 30 to limit the distance which plate 44 may be screwed onto shaft 30. It will be seen that by this construction the grinding wheel 12 can be readily assembled within the mounting assembly and the mounting assembly may be readily placed upon and removed from the power shaft 30. This structure provides for ready replacement of worn grinding wheels and yet provides a simple and strong mounting.

The grinding wheel mounting assembly rotates within the housing 38 which is provided with an exhaust port 72 through which the particles formed during the grinding operation are swept by the current of air produced by rotating vanes 74 formed on ring 46. An annularly shaped guard 76 is provided on the forward edge of the housing 38 to cover the rotating outer edge of the grinding wheel 12. The forwardmost edge 78 of the guard 76 extends inwardly toward the axis of rotation of the grinding wheel 12 whereby to better cover the forward edge of the grinding wheel. Means is provided in the form of a flange 80 fitting within the housing 38 and a pair of set screws 82 for retaining the guard upon the housing 38 which cooperate with the flange 80 for holding the guard 76 in position upon the housing 38. The forward edge of the guard 76 is recessed at two points as at 84 and 86 to form clearance for the roller wheels being ground as will be explained hereinafter.

There is shown in the drawings a preferred application of the present grinding apparatus, namely the grinding of roller skate wheels while the wheels are in position upon the roller wheel axles. The roller skate generally designated by the numeral 88 comprises a shoe support plate 90 upon which are mounted the axle support members 92 and 94 for the front and rear axles respectively. A pair of front wheels 96 are mounted upon the front axle (not shown) and another pair of wheels 98 is mounted upon the rear axle (not shown). Hexagonal nuts 100 are attached to the outer ends of the axles to hold the wheels rotatably in position thereon.

The wheels 96 are mounted in front of the grinding wheel 12 in position for grinding by the roller skate wheel support structure designated by the numeral 18 in Figure 1. The wheel support structure 18 comprises generally a mounting plate 102 which is shiftably mounted upon the base 16 for a purpose which will be more fully explained hereinafter and a wheel axle engaging portion disposed at the upper side of plate 102. Three apertured upstanding lugs 104, 106 and 108 are provided on the forward end of the base 16 and are adapted to receive a horizontally disposed supporting shaft 110. In addition to passing through the apertures in lugs 104, 106 and 108, shaft 110 also passes through apertured lugs 112 and 114 formed on the lower edge of the mounting plate 102. Mounting plate 102 is fixed upon the shaft 110 by means of a set screw 116 which is positioned near the left-hand edge thereof as seen in Figure 2. The mounting plate 102 is shiftable with respect to the base 16 within limits imposed by the position of the lugs 104, 106 and 108 and means in the form of a handle 118 is provided to so shift the plate 102 with respect to the base 16. One end of handle 118 is provided with an aperture through which shaft 110 passes and a nut 120 is provided to secure the handle 118 upon shaft 110 near the righthand end thereof as seen in Figure 2. Handle 118 is also connected to the plate 102 by means of a pin 122 which passes through handle 118 and is embedded in the plate 102. This connection between the handle 118 and the plate 102 allows the plate 102 to be shifted in an arcuate manner about the axis of shaft 110 by moving handle 118 in a vertical plane.

The structure for holding the wheels of the roller skate which are to be ground is positioned upon the upper edge of plate 102. As may be best seen in Figure 2 plate 102 is substantially U-shaped and has two upwardly projecting leg portions 124 and 126. Leg portion 126 has formed on the upper edge thereof an enlarged portion in which is an aperture extending substantially parallel to the face of the grinding wheel 12 and parallel to the base 16. Referring particularly to Figure 5 it will be seen that a rod 128 is positioned within the aperture of leg portion 126. The righthand end of rod 128 as seen in Figure 5 is provided with a knurled knob 130 which is held in position thereon by a screw 132. Positioned at the other end of rod 128 is a nut supporting structure 134. In the embodiment illustrated the nut supporting structure 134 comprises a cylindrical member in which is formed a conoidal aperture within which a nut is adapted to be positioned. It is to be understood that other structures besides a nut can be received by and supported by structure 134. Formed intermediate the length of rod 128 are two grooves 136 and 138. As may be best seen in Figure 6 these grooves 136 and 138 are adapted to cooperate with a pin 140 whereby to position rod 128 within the leg portion 126. Pin 140 is biased toward the engaging position by means of a spring member 142 which acts against an enlarged portion 144 of pin 140. The free end of pin 140 is provided with a handle 146 which is used to retract the pin 140 from the engaging

position. By providing two grooves 136 and 138 the position of rod 128 with respect to leg portion 126 and in turn the position of the engaging member 134 with respect to leg portion 126 may be adjusted whereby to receive roller skate axles having varying lengths.

The upper end of leg portion 124 is similarly enlarged and provided with a longitudinally extending aperture within which is positioned a rod 148. One end of rod 148 has formed thereon a nut receiving member 150 which is identical in construction with the corresponding member 134 on rod 128 and thus the rods with their nut receiving members constitute rod-like clamping members forming axle clamping means. The other end of rod 148 has affixed thereto a handle bracket 152 which is of sufficient length to project between rod 148 and shaft 110. The lower end of handle 152 is in engagement with the shaft 110 to prevent rotation of the handle bracket and for this purpose is provided with an aperture through which shaft 110 extends.

Referring to Figure 2 it will be seen how a set of roller skate wheels is positioned upon the wheel support structure described above. The nuts 100 which retain the wheels upon a wheel axis are engaged by the nut receiving members 134 and 150 on rods 128 and 148 respectively. Pin 140 as explained above with reference to Figure 6 holds rod 128 stationary with respect to leg portion 126. The rod 148 is free to slide within the aperture of leg portion 124 but is biased to the right as seen in Figure 2 by spring means such as a spring 154 which is positioned between a knob 156 on one end of shaft 110 and handle 152.

To mount a set of roller skate wheels in position for grinding the rod 128 is first properly positioned by means of pin 140. For skates having relatively short axles the pin is positioned in groove 138 and for skates having relatively longer axles the pin is placed in groove 136. Handle 152 forms a manually shiftable hand grip which is then pulled to the position shown in dotted lines in Figure 2 whereby to retract rod 148. After placing the roller skate axle in a position to be engaged by the nut receiving members 134 and 150, the handle 152 is released and allowed to assume the position shown in solid lines in Figure 2. The roller skate axle will be firmly held since handle 152 is continually urged to the right by spring 154. The wheels 96 are now in position for grinding.

To grind the wheels 96 the plug 22 is connected to a suitable source of electricity thereby energizing the motor 14 and rotating the grinding wheel 12. Next support plate 102 is first pivoted about shaft 110 by raising handle 118 upwardly until the plate 102 assumes the position shown in Figure 3. As the wheels 96 contact the grinding surface 12, handle 118 is moved horizontally whereby to shift the wheels 96 across the face of the grinding member 12. This latter movement is essential to preserve the life of the grinding member and to insure that the wheels will be evenly ground. The entire movement of the wheels to be ground with respect to the grinding surface 12 is controlled by and accomplished by a single control means, namely, handle 118. This gives a very simple yet effective means of controlling the grinding of the roller wheels. By providing the cut out portions 84 and 86 in the grinding wheel guard 76 the wheels may be moved along the entire surface of the grinding wheel, yet the greater part of the circumference of the grinding wheel is protected for safety purposes.

To protect the operator from particles produced during the grinding operation and to protect and keep clean the working parts of the shifting mechanism a flexible skirt member 158 is positioned between the grinding wheel and shaft 110 and its associated parts. The skirt 158 is positioned upon plate 102 by means of a bar 160 held in position by a plurality of screws 162 which thread into plate 102. The skirt 153 is preferably flexible to permit the necessary movement of the support plate 102 with respect to the base 16.

There has been provided an improved grinding apparatus which is particularly adapted to grinding wheels on roller skates without removing the wheels from the skate frame. An improved and simplified wheel mounting structure is provided in which skates having varying axle lengths may be readily received and in which the wheels are quickly yet firmly mounted. Also an improved structure for moving the wheels against the grinding surface and across the face thereof has been provided in which a single control is used for both placing the wheels against the grinding surface and for moving the wheels across the grinding surface.

Although a preferred embodiment of the invention has been described for purposes of illustration it is to be understood that the invention is not limited to the specific details of the construction disclosed but is capable of various modifications and changes without departing from the scope and spirit of the invention.

I claim:

1. A grinding apparatus for grinding the wheels on roller skates, and comprising a base, a grinding wheel mounted on said base and having a substantially plane grinding surface, means for rotating said grinding wheel, a supporting shaft having the axis thereof extending parallel to the plane of said grinding surface, bearing means on said base for supporting said supporting shaft for sliding and rotating movements, a mounting plate fixed to said supporting shaft, axle clamping means carried by said mounting plate and including a rod-like clamping member slidably mounted on said mounting plate for reciprocation parallel to said supporting shaft and projecting from the edge of said mounting plate, a handle bracket carried by the projecting end of said rod-like member and projecting therefrom into engagement with said supporting shaft whereby to prevent rotation of said handle bracket, spring means associated with the projecting part of said handle bracket for normally urging the handle bracket and rod-like clamping member toward axle clamping position, said projecting handle bracket presenting a hand grip for manually shifting the handle bracket and rod-like clamping member against the action of said spring means and away from axle clamping position, and an operating handle lever fixed with respect to the mounting plate and supporting shaft for tilting the mounting plate about the axis of said supporting shaft and for shifting the same along the axis of said shaft whereby to shift the mounted roller skate wheels parallel to and toward and away from the grinding surface of said grinding wheel.

2. A grinding apparatus as claimed in claim 1, wherein the spring means is carried by said supporting shaft in engagement with said handle

bracket for normally urging the clamping member toward axle clamping position.

3. A grinding apparatus as claimed in claim 1, wherein the supporting shaft extends through an aperture in the projecting part of the handle bracket and the spring means consists of a coil spring carried by the supporting shaft and located between the end thereof and the handle bracket.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
548,298	Darling	Oct. 22, 1895
554,797	Roberts	Feb. 18, 1896
615,089	Murdock	Nov. 29, 1898
656,685	Wilhelm	Aug. 28, 1900
821,143	Walsh	May 22, 1906
1,608,374	Desjardins	Nov. 23, 1926
2,252,287	Helfgott	Aug. 12, 1941
2,259,883	Gleba	Oct. 21, 1941
2,419,179	Swindle	Apr. 15, 1947
2,450,135	Hager	Sept. 28, 1948
2,490,480	Schubert	Dec. 6, 1949