April 17, 1962 J. A. SIMENDINGER 3,029,566

CONTACT WHEELS

Filed Aug. 4, 1958 2 Sheets-Sheet 1

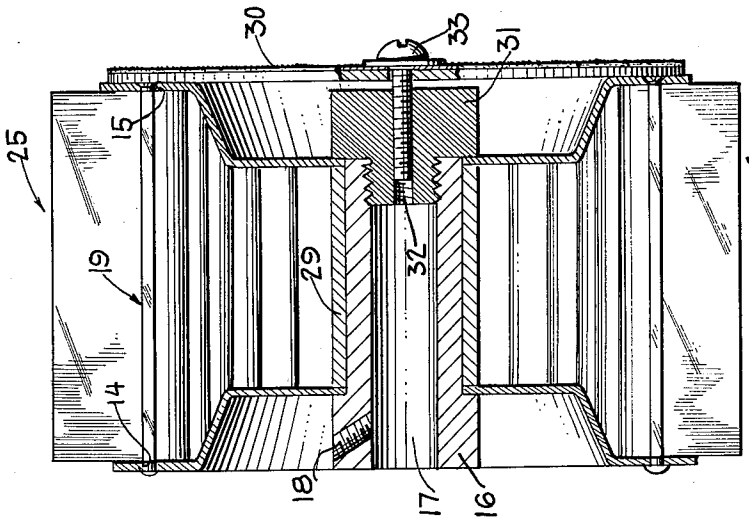


Fig. 5

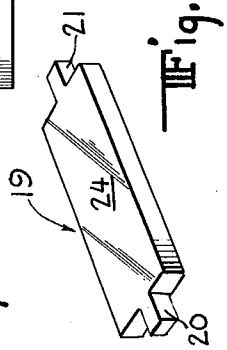


Fig. 4

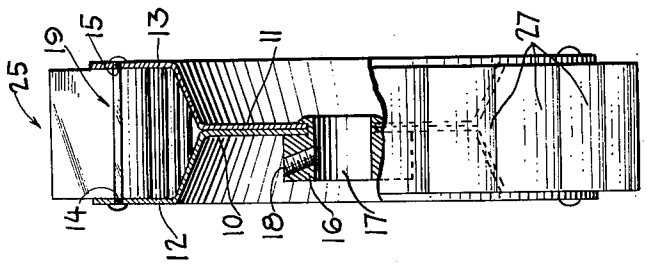


Fig. 2

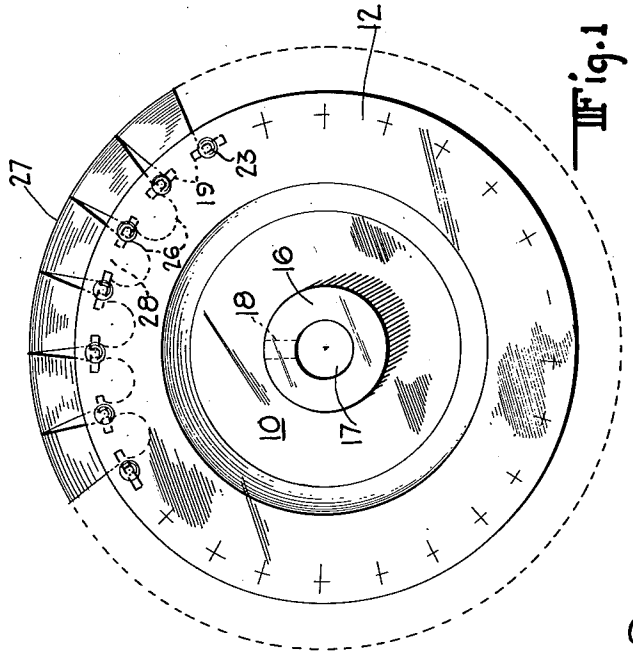


Fig. 1

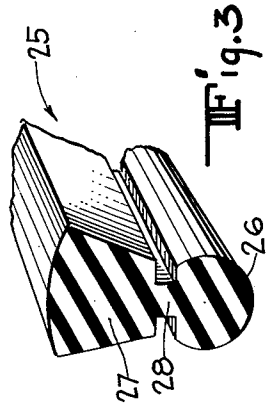


Fig. 3

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CONTACT WHEELS

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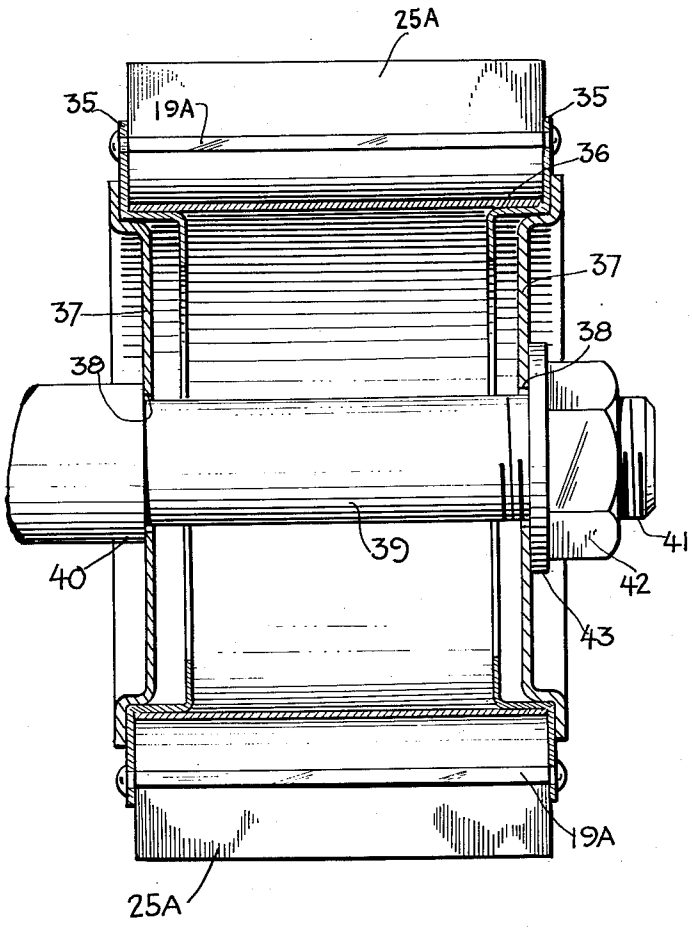


Fig. 6

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3,029,566
CONTACT WHEELS

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2 Claims. (Cl. 51—141)

This invention relates to contact or drive wheels especially adapted for backing-up an abrasive belt for abrasive finishing operations.

Previous back-up wheels have included drums with rubber tire-like faces thereon. However, since variations in durometer or resiliency of the wheel surfaces are necessary because of variations in the belt or in the object being operated upon, this type of back-up wheel requires a plurality of complete wheels having surfaces of different resiliency, thereby increasing expense.

In order to overcome the deficiencies present in such previously used back-up wheels, a metal or solid material drum having its periphery slotted or serrated and having resilient inserts held in the slots has proved successful. This is due to the ready interchangeability of the resilient inserts to permit any desired durometer or resiliency for the wheel surface. Such back-up wheels are disclosed in applicant's copending applications, Serial No. 515,815, filed June 16, 1955, now Patent No. 2,850,-853, issued September 9, 1958, and Serial No. 658,579, filed May 13, 1957, now Patent No. 2,977,725, issued April 4, 1961. Although such contact wheels have proven very effective for certain types of operations, a built-up or fabricated drum constructed of formed sheet metal elements may be highly desirable from a cost standpoint.

One of the objects of the invention is to provide a contact, back-up, or drive wheel for abrasive belt finishing in which the drum for holding individual resilient inserts is fabricated from a number of sheet metal parts rather than from a drum having grooves formed in the periphery.

A further object of the invention is to provide a drum for holding resilient inserts or contact members about its periphery in which the inserts are firmly held in position by bars extending between two side plates of the drum.

A still further object of the invention is to provide a contact wheel including a number of resilient inserts and a fabricated drum for holding the inserts.

According to the invention, the contact or back-up wheel includes a pair of axially spaced side plates and a plurality of circumferentially spaced supporting bars which are held between the plates adjacent their outer periphery. These bars serve to hold a plurality of resilient contact members in position about the drum. The contact members include widened base portions, widened contact portions, and relatively narrow neck portions connecting the base portions and the contact portions. It is the neck portions which are held in position between the adjacent bars so that the widened contact portions will extend beyond the outer periphery of the side plates where they are engaged by the abrasive belt.

According to a further aspect of the invention, the bars are uniformly spaced about the periphery of the plates and the inserts are substantially uniform in size and shape.

In a still further aspect of the invention, the side plates can be arranged to be separated by a spacing member and held in place by a pair of flange or disc means. The flange means have shaft receiving apertures therein for receiving a driving shaft to which the assembly is secured.

These and other objects, advantages and features of

the invention will become apparent from the following description and drawings.

In the drawings:

FIG. 1 is a side view of the back-up wheel of the invention;

FIG. 2 is an edge view of the contact wheel of FIG. 1 with parts being broken away to more clearly show the construction thereof;

FIG. 3 is a perspective view of one form of insert which may be used with the drum shown in FIGS. 1 and 2;

FIG. 4 is a perspective view of one form of the bar or way which may be used with the contact wheel of the invention;

FIG. 5 is a cross-sectional view of another form of contact wheel constructed in accordance with the invention; and

FIG. 6 is a cross-sectional view of a modified form of the invention.

The wheel of the invention may be used for various purposes but is particularly useful as a back-up arrangement for an endless abrasive belt finishing or abrading machine. Such a machine is shown schematically in the two copending applications identified above. In such a device two wheels are normally provided, one being driven by a suitable motor, and an endless belt, which is driven at a relatively high linear speed, extending between the wheels. The work piece is placed on a work table and is pressed into contact with the abrasive belt so as to finish the desired surface.

As shown in FIGS. 1 and 2, the drum of the invention includes two dish-shaped side plates **10** and **11** which have radially extending annular flanges **12** and **13**, respectively, at their outer periphery. The plates **10** and **11** are positioned so that they are coaxial and so that their radial flanges extend away from each other, thereby resulting in axial spacing between the radial flanges adjacent the outer periphery of the drum. Of course, it is obvious that plates **10** and **11** could be flat discs spaced from each other by any suitable means. Flange portions **12** and **13** are provided with aligned openings **14** and **15**, respectively, spaced about the circumference thereof adjacent their outer periphery. In the form shown in FIGS. 1 and 2, the dished portions of plates **10** and **11** are held together by a supporting member **16** having a bore **17** therethrough adapted to receive a shaft (not shown) for rotation therewith. Set screw **18** may be provided to secure supporting member **16** to the shaft.

Bars or ways **19**, shown in FIG. 4, are rectangular in shape and have tangs or projections **20** and **21** extending from their ends. The tangs **20** and **21** pass through aligned openings **14** and **15** in the flange portions **12** and **13** of side plates **10** and **11**. They may be secured in position by riveting the ends over the side plates, as shown at **23** in FIG. 1, by welding, or by any other suitable method. The bars **19** are positioned so that wall **24** is generally parallel to the peripheral edge of flange portions **12** and **13**. Thus, when all of the bars are in position, a circle of proper radius will pass through the axis of each tang.

A plurality of resilient inserts **25**, as shown in FIG. 3, are inserted between adjacent bars or ways **19** about the entire periphery of the fabricated drum. As can be seen in FIG. 3, the resilient inserts include a widened base portion **26**, a widened contact portion **27**, and a relatively narrow neck portion **28** connecting the base portion and the contact portion. As can further be seen in FIG. 3, the insert is preferably formed so that the upper surface of base portion **26**, the lower surface of contact portion **27**, and the side edges of neck portion **28** are all flat. The height of neck portion **28** is selected to be substantially the same as the thickness of bar **19**.

Thus, when the inserts are in position between adjacent bars the insert is compressed and contacts three sides of each bar to insure their firm securement in position. The bars are spaced such that the inserts will be positioned about the periphery of the drum in the manner shown in Patent No. 2,850,853, so that the abrasive belt will not contact any portion of the drum. As disclosed in both of the above-mentioned copending applications, the resilient inserts may, for example, be made from extruded rubber, neoprene or other similar rubber-like or resilient material.

If desired, the inserts may be of the type disclosed in copending application, Serial No. 658,579, wherein the base portion **26** and the contact portion **27** have different hardnesses for the purposes set forth in said application. It is also clear that the specific construction or shape of both the resilient members **25** and the bars **19** may be varied without departing from the inventive concept herein.

As shown in FIG. 5, the spacing between flanges **14** and **15** may be increased for use with wider belts by utilizing a spacer sleeve **29** and an elongated supporting member **16** of the desired lengths.

As also shown in FIG. 5, an abrasive disc **30** may be secured to one or both of the sides of the back-up wheel for special abrading or finishing purposes. This disc may be secured to supporting member **16** by utlizing a spacer block **31** threadingly engaged in bore **17** and having a bore **32** therein adapted to receive a bolt **33**. Such a disc could also be used with the back-up wheel shown in FIGS. 1 and 2.

If desired, the wheel can be made with a relatively large central aperture as seen in FIG. 6 wherein the disc or side plates **35**, **35** have bars **19A** holding resilient inserts **25A** in a manner similar to that described for the FIGS. 1 to 5, inclusive. Hollow cylinder or spacing means **36** is clamped between side plates **35** by holding discs or flanges **37**. Said discs have apertures **38** for receiving rotating or drive shaft **39**. The drive shaft may have a shoulder at **40** and may be threaded at **41** for receiving nut **42** which bears against washer **43**.

What is claimed is:

1. In a contact back-up wheel for a belt, the combination of a pair of dish-shaped side plates having corresponding circumferentially spaced openings therein, the portions of said side plates adjacent the periphery thereof being axially spaced while the central portions thereof are in contact, means for holding the central portions in contact and for supporting said back-up wheel on a shaft, a plurality of flat rectangular supporting bars having tangs at their ends which are received in said openings so that said supporting bars are held between said plates adjacent the outer periphery thereof, and a plurality of substantially identical resilient contact members having widened base portions, widened contact portions and relatively narrow neck portions connecting said base portions and said contact portions, said neck portions, the top surface of said base portions and the bottom surface of said contact portions all being flat so as to form a pair of rectangularly shaped grooves in said contact members, each of said neck portions being held in position and compressed between the narrow faces of two adjacent bars which fit into said grooves so that said widened contact portions are held in a position where they extend beyond the outer periphery of said side plates and are engaged by said belt.

2. In a contact back-up wheel for a belt, the combination of a pair of dish-shaped side plates having corresponding circumferentially spaced openings therein, the portions of said side plates adjacent the periphery thereof being axially spaced, means for holding the central portions in fixed assembled relation relative to each other and for supporting said back-up wheel on a shaft, a plurality of flat rectangular supporting bars having tangs at their ends which are received in said openings so that said supporting bars are held between said plates adjacent the outer periphery thereof, and a plurality of substantially identical resilient contact members having widened base portions, widened contact portions and relatively narrow neck portions connecting said base portions and said contact portions, said neck portions, the top surface of said base portions and the bottom surface of said contact portions all being flat so as to form a pair of rectangularly shaped grooves in said contact members, each of said neck portions being held in position and compressed between the narrow faces of two adjacent bars which fit into said grooves so that said widened contact portions are held in a position where they extend beyond the outer periphery of said side plates and are engaged by said belt.

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