Dec. 6, 1960 F. N. RUSHTON ET AL 2,962,742

ARTICLE POLISHING MACHINE

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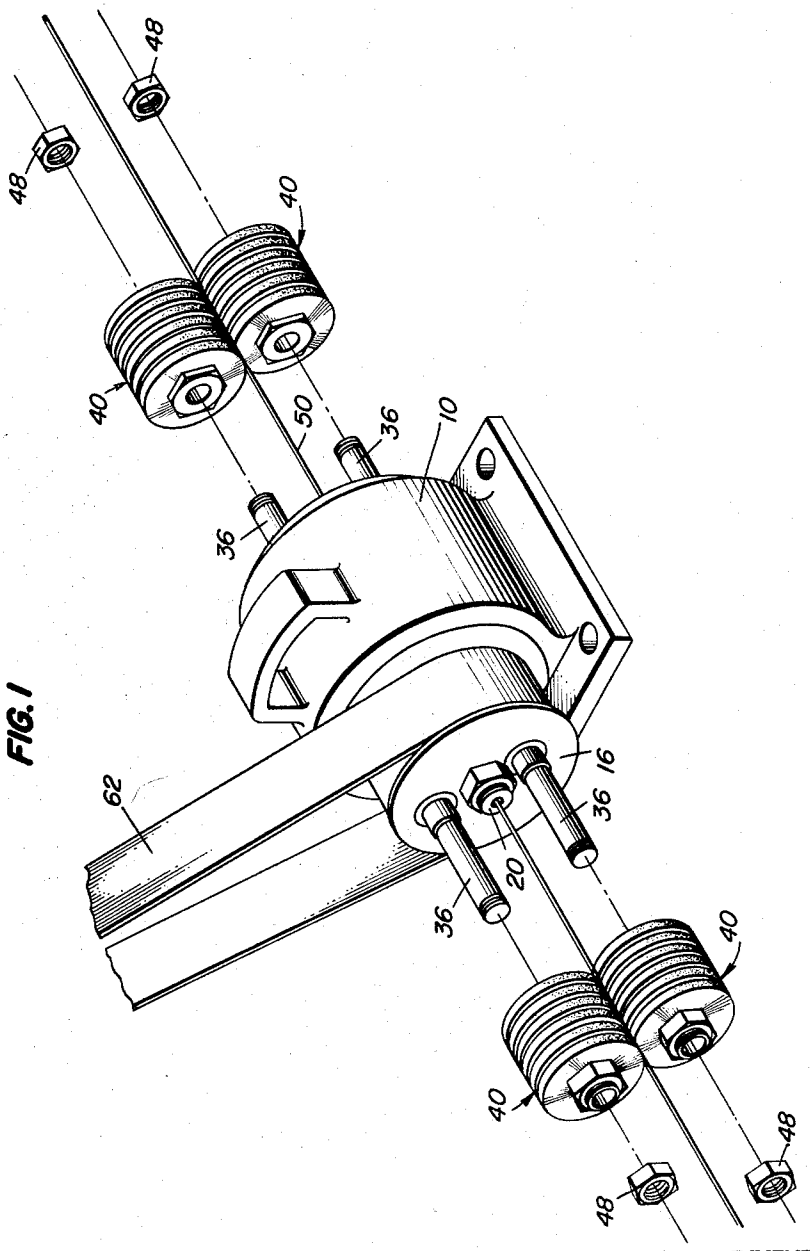



FIG. 1

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ARTICLE POLISHING MACHINE

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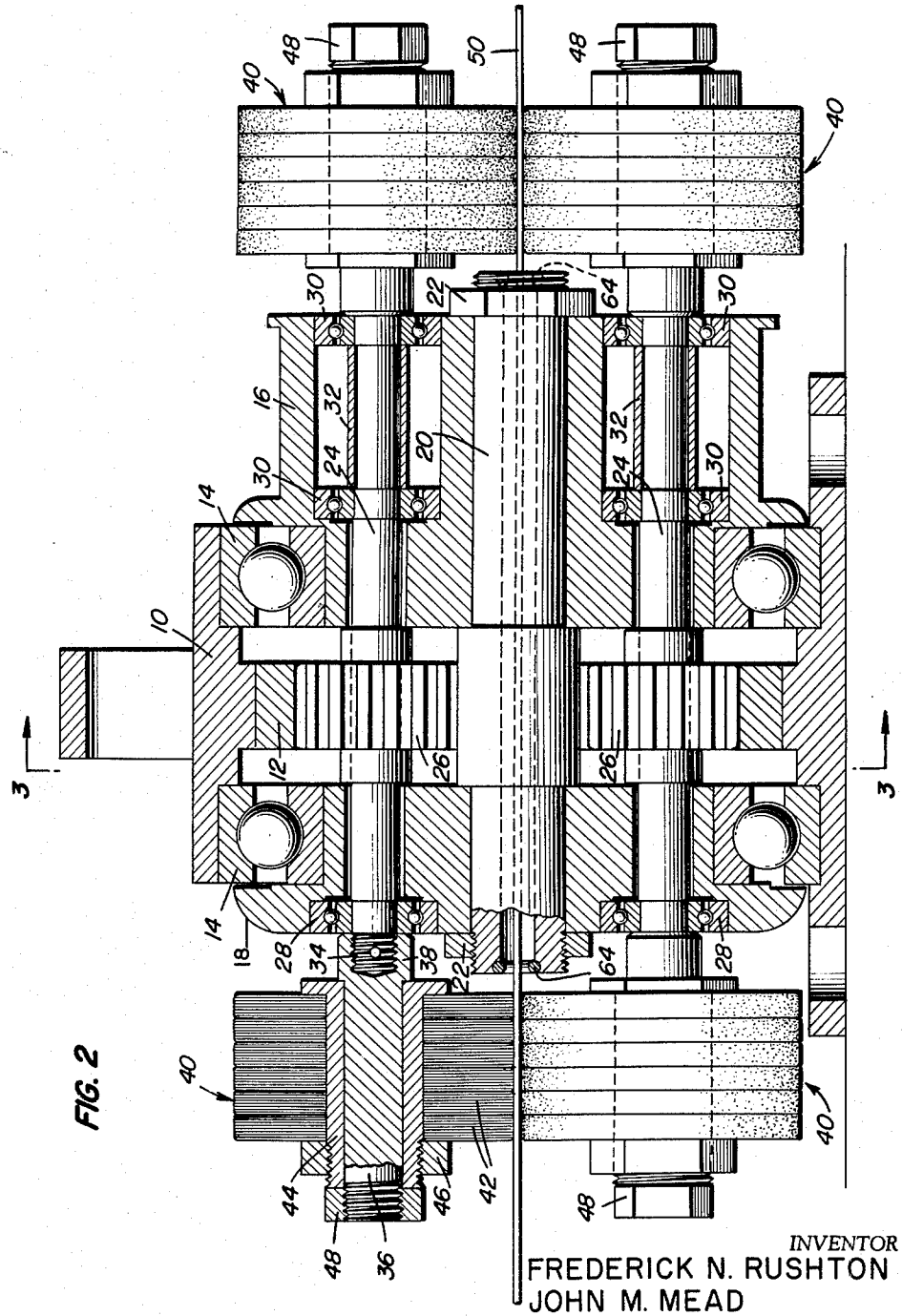



FIG. 2

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FIG. 3

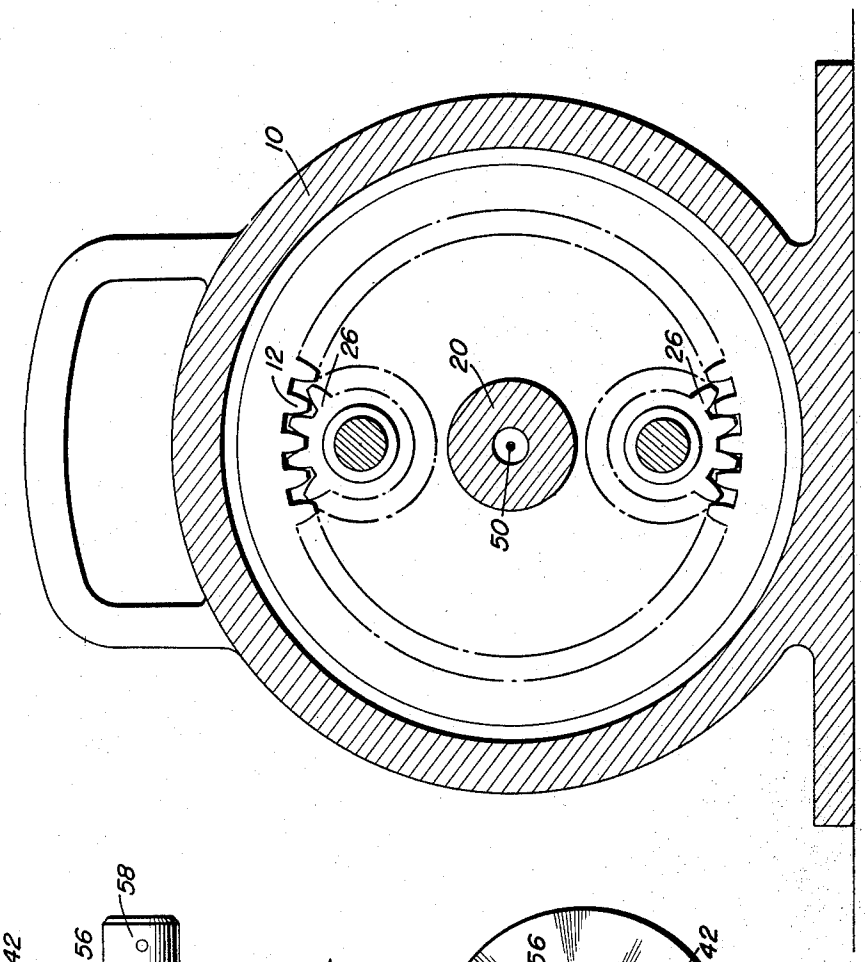



FIG. 4

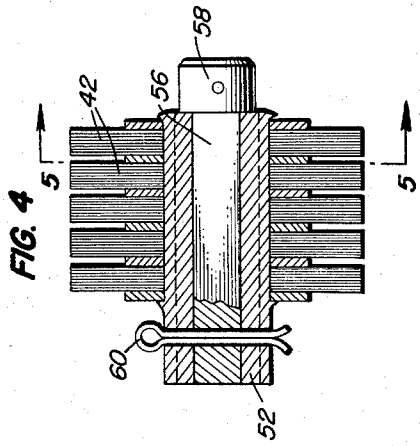
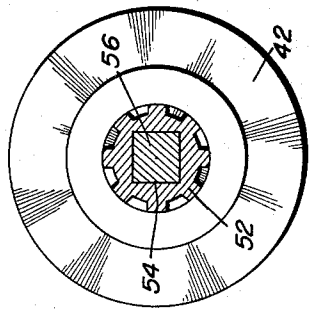



FIG. 5




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United States Patent Office 2,962,742 Patented Dec. 6, 1960



2,962,742

# ARTICLE POLISHING MACHINE

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Filed Oct. 30, 1958, Ser. No. 770,682

8 Claims. (Cl. 15—88)

This invention relates generally to metalworking apparatus, and more particularly, it pertains to an article polishing machine, such as for wire or rods made of metal or similar material. It is to be pointed out that although the machine comprising this invention is illustrated in connection with the brushing and polishing of metallic wire or rod, it is not limited thereto as it can be readily adapted to cleaning, brushing, and polishing other materials, of either a metallic or non-metallic nature.

It is sometimes required that a polishing operation be performed on wire or rod subsequent to its drawing or extrusion in order to obtain a commercially acceptable product.

In some cases, it is necessary to perform the polishing operation of the wire in more than one stage; for example, a rough preliminary brushing stage followed by a final smoothing operation thereof.

It is, therefore, an object of this invention to provide a simple, efficient wire polishing machine, having readily accessible brushes for servicing or replacement.

It is another object of this invention to provide a wire polishing or brushing machine having two consecutive polishing stages.

Still other objects of this invention are to provide wire polishing apparatus which is economical to manufacture, compact, easy to install and maintain, and which is efficient and reliable in operation.

These and other objects and advantages of this invention will become more readily apparent and understood from the accompanying specification and drawings in which:

Fig. 1 is a perspective view of an article polishing machine embodying features of the invention with the brushes removed for purposes of clarity;

Fig. 2 is a horizontal cross-section, partly broken away, of the article polishing machine of Fig. 1;

Fig. 3 is a cross-section taken along line 3—3 of Fig. 2;

Fig. 4 illustrates a partial cross-section of a detail and alternate brush assembly for the article polishing machine of Fig. 1; and

Fig. 5 is a cross-section taken along line 5—5 of Fig. 4.

Referring to Figs. 1, 2, and 3 of the drawings, there is shown, in general, an article brushing and polishing machine which consists of a housing 10. This housing 10 is of annular shape and arranged to receive a ring gear 12 centrally and coaxially therein. A pair of race ball bearings 14 are inserted on either end of housing 10, as best illustrated in Fig. 2. A pully 16 is machined to fit within one bearing 14, and a cap 18 is similarly inserted within the opposing bearing 14.

Both the pulley 16 and cap 18 are axially bored to receive a hollow shaft 20 which also serves to secure them together by means of lock nuts 22 located at each end. Cap 18 and pulley 16 are both additionally drilled at two diametrically opposite places to receive a pair of shafts 24. Shafts 24 are each fitted with a spur gear 26 in tooth engagement with ring gear 12 as illustrated in Fig. 3.



A race bearing 28 supports each shaft 24 at one end, while a pair of race bearings 30, separated by a spacer tube 32, supports the other end of each shaft. Each shaft 24 has threaded ends 34 adapted to receive the internally threaded heads 38 of short shafts 36 located at opposite ends of each shaft 24.

A brush assembly 40, as best illustrated in Fig. 2, is made up of a plurality of brush wheels 42 assembled upon a threaded thimble 44 and the wheels 42 are secured together by means of a nut 46. An entire brush assembly 40 is closely fitted to each short shaft 36, and it is secured thereon by means of a nut 48. The brush wheels 42 of adjoining brush assemblies 40 are dimensioned to bear against a wire or rod 50 passed therebetween and through the hollow center of shaft 20. The wire or rod 50 can be fed through the machine from an electrolytic bath after being coated therein, and after passing through the machine is coiled on a reel (not shown).

As shown in Fig. 1, a belt drive 62 is utilized to drive pulley 16, thus radially rotating short shafts 36 about hollow shaft 20 and wire to be polished 50. This belt drive 62 can be coupled to a source of power, such as a constant speed or variable speed motor.

In addition to their orbital motion about wire 50, shafts 36 also rotate as they are driven by spur gears 26 within the housing 10. Brush assemblies 40 are thus given an opposing rotary motion with respect to each other and with respect to the axially disposed wire 50.

As the wire 50 is passed longitudinally through the machine, it receives a first stage brushing operation by the brushes 42 of the first set of brush assemblies 40 and then receives a second stage polishing operation by the brushes 42 of the second set of brush assemblies 40 located at the opposite end of the article brushing and polishing machine.

The brush assemblies 40 on the upstream side of the apparatus may be of different coarseness than those on the downstream side.

In order to prevent brush wheels 42 of brush assemblies 40 from slipping under heavy duty, they may be assembled to a longitudinally serrated bushing 52 and peened thereon by upsetting the metal as shown in Figs. 4 and 5. By means of a square hole 54, serrated bushing 52 is placed over a square short shaft 56 and secured there by cotter pin 60 and internally threaded head 58 provided on shaft 56 can then be used for securement to threaded shaft ends 34. For high-speed production runs, a carbided or hardened liner 64 is provided at the entering and leaving ends of the hollow shaft 20.

In order to develp longer use of polishing brushes, an adjustable carbaloy platen (not shown) may be added in place of one brush assembly 40 opposing the other brush assembly and pressing the material being polished against the other brushes 42.

While there has been here described and illustrated a preferred form of the invention, it is apparent that certain variations may be made without departing from the spirit thereof. Accordingly, limitation of the invention is sought only in accordance with the following claims.

What is claimed is:

1. An automatically operated apparatus for polishing continuous articles passing therethrough, such as electrolytically coated wire, rod, or the like to impart a high lustre to the external surface thereof, comprising, an annular shaped housing, means including an internally toothed ring gear coaxially arranged and fixed in position in said housing intermediate the ends thereof, means including a race bearing positioned in each of the oppo-

site ends of said housing, respectively, and spaced from said fixed ring gear, a hollow drive shaft extending longitudinally through said housing and said race bearings, means including a pulley spaced from said housing and having an annular portion thereof extending from said pulley and arranged between the inner surface of one of said race bearings and the outer surface of said drive shaft and secured to said drive shaft for rotation therewith, a cap structure positioned in the other end of said housing and having a portion thereof located between the inner surface of said other race bearing and said outer surface of said hollow drive shaft and secured thereto for rotation therewith, said cap structure and pulley being fixedly secured together by said drive shaft, said pulley and cap structure having diametrically opposed openings therethrough, a bearing located in each of said diametrically opposed openings in said cap structure and pulley, a pair of diametrically opposed shafts extending through said openings, spaced bearings in said cap structure and pulley for supporting said diametrically opposed shafts for rotation within said cap structure and pulley, means for mechanically coupling each of said pair of diametrically opposed shafts to said ring gear to rotate in orbital motion with respect to said ring gear, and a brush assembly at at least one of the corresponding ends of each of said pair of shafts and in surface contact with said article continuously passed through said hollow shaft, said brush assemblies being arranged to simultaneously rotate and revolve about said article for brushing and polishing thereof so as to impart a high lustre to the external surface thereof.



2. An arrangement as recited in claim 1, and additionally means for rotating said pulley.

3. An arrangement as recited in claim 1, wherein a brush assembly is positioned at each end of said pair of shafts.

4. An arrangement as recited in claiim 1, wherein the means for mechanically coupling each of said pair of shafts to said ring gear includes a spur gear.

5. An arrangement as recited in claim 1, and additionally means for securing each said brush assembly to its corresponding shaft so as to prevent slippage thereof.

6. An arrangement as recited in claim 5, wherein each brush assembly consists of a plurality of brush wheels.

7. An arrangement as recited in claim 1, and a base for said annular shaped housing.

8. An arrangement as recited in claim 1, and means for picking up said housing.

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