

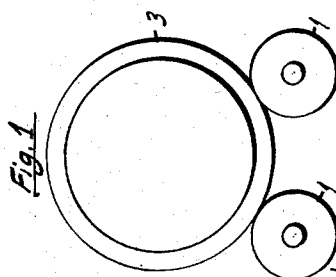
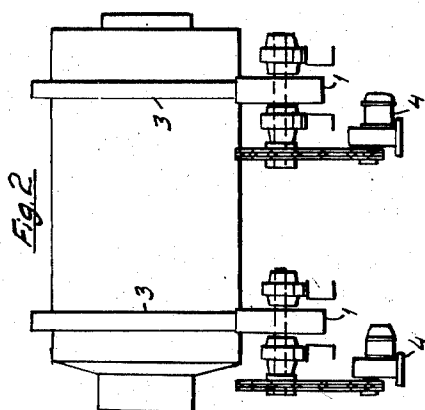
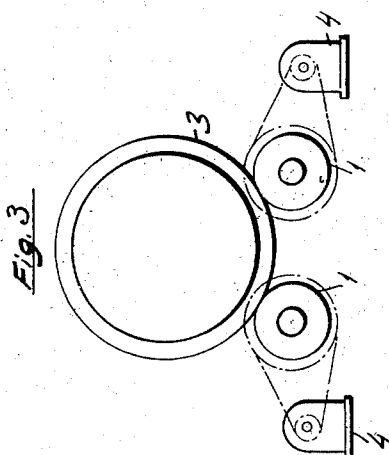
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DEVICE FOR FRICTION DRIVEN DRUMS

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DEVICE FOR FRICTION DRIVEN DRUMS

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The present invention relates to a device for those horizontally mounted, possibly more or less inclined rotary drums, furnaces, containers and the like, to which the driving power is transmitted by friction from driving rollers which at the same time wholly or partly support the drum etc.

It is known per se to provide such a drive from an electric motor via a single roller, in which case, however, the friction between the roller and the drum is often not sufficient. Or the drive is effected via two rollers connected to one another in some way or other and driven by one and the same motor. The drive in the latter case has also some drawbacks.

Figs. 1 and 2 show diagrammatically an end view and a side view respectively of a rotary drum fitted with a drive device according to the present invention. Fig. 3 shows diagrammatically another embodiment of the drive device in end view.

Prior art arrangements where two driving rollers are mounted on the same drive shaft and carry almost the whole weight of the drum have the essential drawback that sliding friction must arise between one of the rollers and the driving ring, because there is no practical possibility of giving (by a treatment also including turning) exactly the same diameter to the two driving rings on the drum, on the one hand, and to the two driving rollers, on the other hand, so that the transmitted speed will be the same for both rollers. The transmission difference increases further, in those cases in which the drum is heated, as soon as the heating becomes irregular so that one driving ring becomes hotter than the other and, consequently, has a larger diameter than the other.

According to the present invention two or more driving rollers are provided each with its individual drive motor, i. e. two or more electric motors work in parallel each on its individual driving roller. It is then unimportant if one transmission should give somewhat greater speed than the other, the motors equalizing this difference by variation of their own speeds.

Such a drive is shown in Fig. 2. The drum is shown supported by a pair of rollers 1 at each end, see also Fig. 1, each roller of each pair being driven individually by a motor 4.

The invention may be applied also in the way shown in Fig. 3, viz. in such a way that a motor 4 is connected to each supporting roller 1 in the roller pair or, in other words, that two motors drive one and the same driving ring or each driv-

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ing ring 3 even if there are more than two rings.

It is therefore clear that I have provided in combination with a rotatable drum embodying a drivable ring and in which rollers support and frictionally drive the drum by contacting the ring, and in which the rollers can have varying diameters due to faulty manufacture and in instances where the drum forms a through passage for material to be treated and is heated by gas passing therethrough the heat effect can cause distortions, a drive device including as many electric speed motors as there are driving rollers, the motors and rollers being connected to each other individually so that each roller has its own driving motor that is driven independently of any other driving motor, the motors varying their own speeds automatically and at certain limits automatically equalizing differences between the ratios of the driving rollers and the ring.

It should be mentioned that all supporting rollers need not be driven.

By this invention a drive for drums and the like by means of toothed wheels, chain wheels or the like may in many cases be completely avoided. Naturally, smaller and cheaper motors are required, when more than one motor is used for the drive.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A driven element capable of having varying diameters at opposite ends either in manufacture or in operation, driving means for each end of said element for driving said element at a uniform angular velocity comprising motor driven means driving one end at one linear speed and motor driven means driving the opposite end at a different linear speed to thereby impart uniform angular velocity to the driven element.

2. A rotatable drum, spaced friction rings thereon adjacent the opposite ends thereof, said rings capable of having varying diameters either in manufacture or in operation of the drum, and driving means for each end of the drum for rotating the same at a uniform angular velocity comprising at least one roller frictionally contacting each ring and separate variable speed motors driving the rollers, the motors operating at different speeds to drive one end of the drum at one linear speed and the opposite end of the drum at a different linear speed to thereby impart uniform angular velocity to the drum.

3. A rotatable drum, spaced friction rings

thereon adjacent the opposite ends thereof, said rings capable of having varying diameters either in manufacture or in operation of the drum, a pair of rollers frictionally engaging each ring, the rollers of each pair being disposed on opposite sides of the longitudinal axis of the drum, one roller of each pair constituting a driving roller and the other roller of each pair constituting an idling supporting roller, driving means for each end of the drum for imparting uniform angular velocity thereto comprising a separate variable speed motor for the driving roller of each pair of rollers, one motor operating at one speed and the other motor operating at a different speed thereby driving the opposite ends of the drum at different linear speeds to impart uniform angular velocity thereto.

4. A rotatable drum, spaced friction rings thereon, said rings capable of having varying diameters either in manufacture or in operation of the drum, a plurality of rollers frictionally contacting each ring, a plurality of variable speed motors, each motor driving one of said rollers, the motors and rollers constituting driving means for the opposite ends of the drum, the said motors operating at different speeds to drive the opposite ends of the drum at different linear speeds to thereby impart uniform angular velocity to the drum.

5. The combination with a rotatable drum having spaced friction rings adjacent the opposite ends thereof and rollers contacting each ring, said rings capable of having varying diameters either in manufacture or in operation and said rollers capable of having varying diameters in manufacture of driving means for the opposite ends of the drum to impart uniform angular velocity thereto despite the irregularities mentioned, comprising separate variable speed motors driving the rollers in contact with the rings at the opposite ends of the drum at different speeds to compensate for differences between the driving ratios of the rollers and the rings so that the opposite ends of the drum and the varying diameter rollers rotate at different linear speeds to impart the uniform angular velocity to the drum.

6. A rotatable drum, spaced friction rings capable of having varying diameters either in manufacture or in operation of the drum disposed adjacent the opposite ends thereof, driving means for each end of said drum for driving the same at a uniform angular velocity, comprising a roller frictionally contacting the ring at one end of the drum and driving the drum at one linear speed, a roller frictionally contacting the ring at the opposite end of the drum and driving this end of the drum at a different linear speed to thereby impart the uniform angular velocity to the drum, and an individual variable speed motor driving each roller.

7. A drive for a rotary drum and the like including longitudinally spaced friction rings on the drum and driving means for the drum comprising at least two rollers in frictional engagement with each ring, and a separate electric motor driving each roller whereby differences between the driving ratio of the rollers and the

rings may be equalized automatically by the motors.

8. A rotatable drum for use in hot or cold tumbling or treating various types of material having longitudinally spaced roller supported rings thereon, said rings capable of having varying diameters either in manufacture or in operation of the drum, driving means for the drum comprising a roller frictionally contacting one of the rings, another roller frictionally contacting another ring, individual variable speed motors driving each roller, the motors capable of self adjusting their speeds in correspondence to variations of the driving ratios of the rollers and the rings so that the peripheral velocity of each ring is always the same as the peripheral velocity of the roller contacting the same.

9. A rotatable drum for use in hot or cold tumbling or treating of various types of materials having longitudinally spaced roller supported rings and at least two rollers contacting each ring, said rollers capable of having varying diameters in manufacture, driving means for at least one pair of rollers to transmit uniform angular velocity from said driving rollers to the ring and the drum despite the irregularities mentioned comprising separate variable speed motors driving the rollers individually, said motors capable of self adjusting their speeds to compensate for differences between the driving ratios of the rollers and the ring contacting the same.

10. In a combination with a rotatable drum and the like of the type which is supported and frictionally driven by rollers contacting rings on the drum which are spaced longitudinally, a drive device including as many electric speed motors as there are driving rollers, said motors and rollers being connected to each other individually so that each roller has its own motor and is driven independently of any other driving roller.

11. In combination with a rotatable drum embodying a drivable ring, which drum forms a through passage for material to be treated and drum ring contacting rollers supporting and frictionally driving the ring and thereby the drum, a drive device including as many electric speed motors as there are driving rollers, said motors and rollers being connected to each other individually so that each roller has its own motor and is driven independently of any other driving roller, each motor automatically self-adjusting in speed to automatically equalize any differences between the ratios of the respective rollers and the ring.

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