# United States Patent [19]

**Edwards**

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[54] **VARIABLE SPEED DRIVE FOR A POTTER'S WHEEL**


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[51] **Int. Cl.** ..... **B28b 1/02**

[58] **Field of Search** ..... 425/263, 459; 74/191, 192, 74/193, 207



[56] **References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 154,156 | 8/1874 | Shuttleworth | 74/191 |
| 1,193,448 | 8/1916 | Ashton et al. | 74/207 |
| 1,284,969 | 11/1918 | Anderson | 74/194 |
| 1,632,795 | 6/1927 | Maimin | 74/207 |
| 2,459,917 | 1/1949 | Carrington | 74/207 |
| 2,649,729 | 8/1953 | Smith | 74/191 |
| 2,902,741 | 9/1959 | Hankin | 425/459 |



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[57] **ABSTRACT**

A drive disc is connected to a lower portion of a vertical drive shaft of a potter's wheel. An electric motor driven drive cone contacts a flexible peripheral portion of the drive disc. The drive motor is mounted for pivotal movement about a horizontal axis. The drive cone includes a convex drive surface of circular longitudinal curvature which travels a circular curve during motor movement. The motor is moved to change the diameter of the circle of contact of the drive cone with the drive disc, to in that manner change the drive speed of the potter's wheel.


**2 Claims, 3 Drawing Figures**

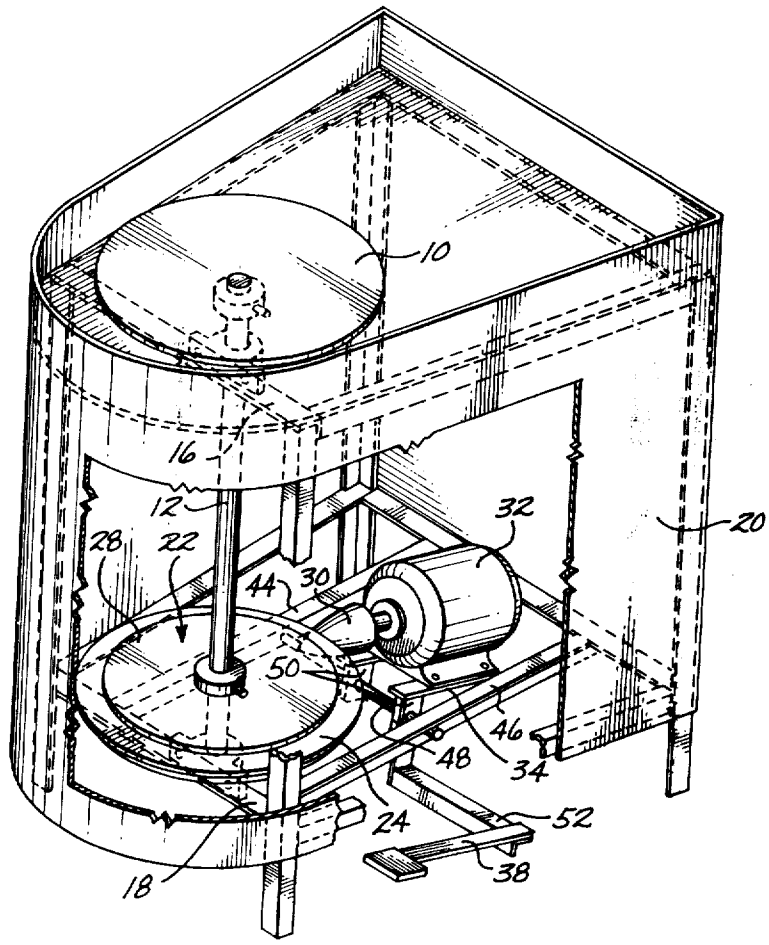
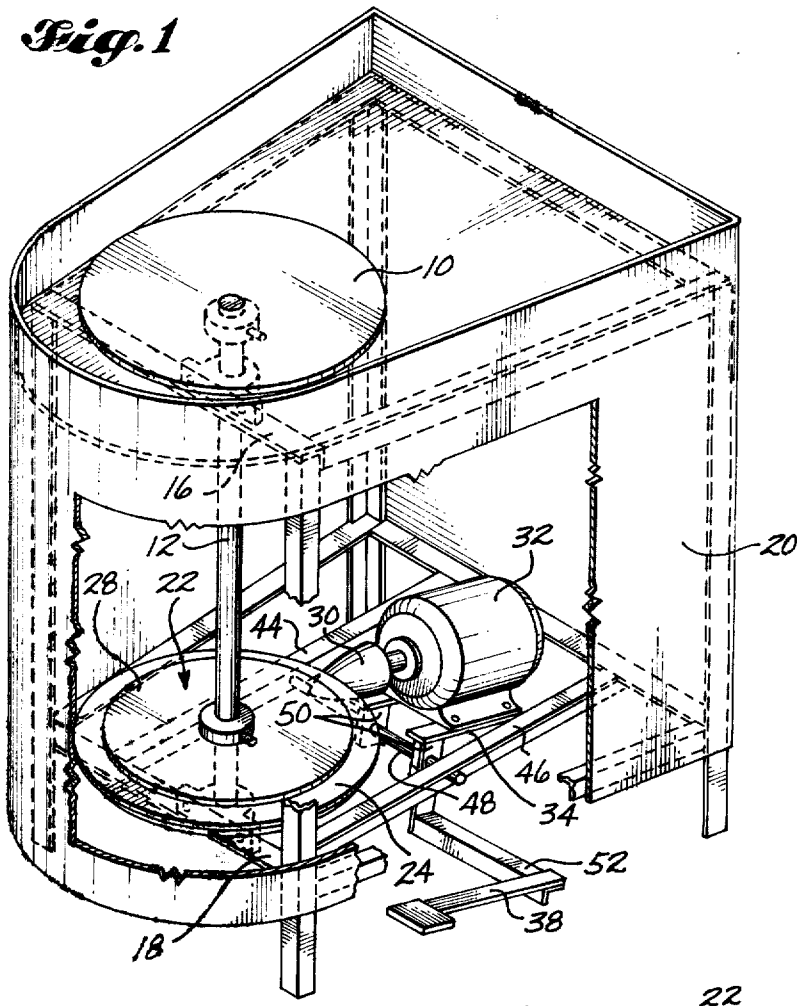


Fig. 1



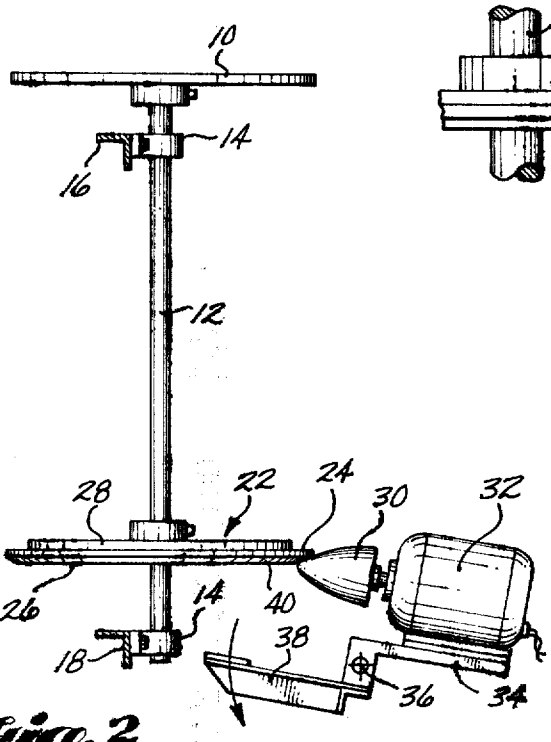




Fig. 2

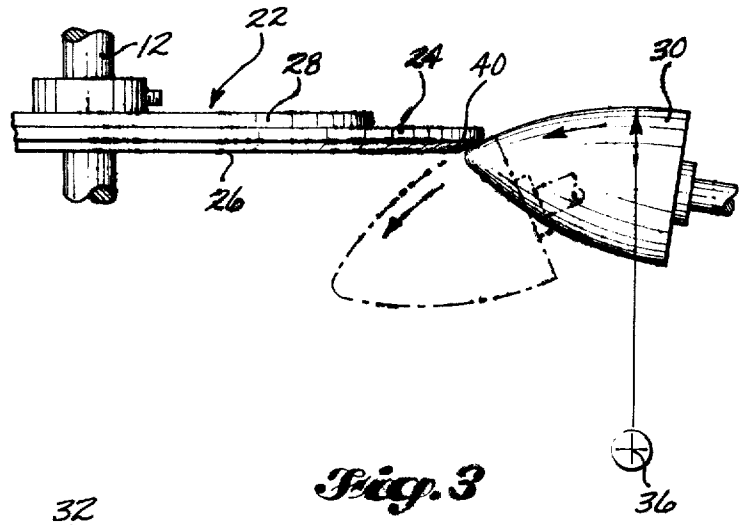



Fig. 3

# VARIABLE SPEED DRIVE FOR A POTTER'S WHEEL

## BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to potter's wheels, and more particularly to an improved variable speed drive mechanism for a potter's wheel.

2. Description of the Prior Art

Prior art drive mechanisms for potter's wheels are shown by U.S. Pat. No. 566,036, granted Aug. 18, 1896 to Daniel Taylor, by U.S. Pat. No. 1,602,122, granted Oct. 5, 1926 to John L. Reed, by U.S. Pat. No. 2,554,836, granted May 29, 1951 to Martin M. Miller, by U.S. Pat. No. 2,902,741, granted Sept. 8, 1959 to John H. Hanken, Jr., by U.S. Pat. No. 3,036,355, granted May 29, 1962, to Howard D. Mays et al, by U.S. Pat. No. 3,055,047, granted Sept. 25, 1962, to Carl Preissler, by U.S. Pat. No. 3,605,218, granted Sept. 20, 1971 to Peter D. Rasmussen and by British Pat. No. 1,223,108, granted Feb. 24, 1971 to J. W. Ratcliffe and Sons, Ltd.

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## SUMMARY OF THE INVENTION

The variable speed drive mechanism of this invention simply comprises a drive disc which is connected to a lower portion of the potter's wheel drive shaft and an electric motor driven drive cone which makes contact with a flexible peripheral portion of the drive disc. The drive motor is mounted to be pivoted in position for the purpose of varying the diameter of contact of the drive cone with the drive disc.

According to an aspect of the invention, the drive motor is mounted onto a base which in turn is mounted for pivotal movement about a horizontal axis. A foot pedal or the like is provided for pivoting the base, and hence the motor driven drive cone supported thereon, about the horizontal axis. Pressure on the pedal pivots the platform in a direction resulting in an increase in the diameter of the ring of contact of the drive cone with the drive disc, and an increase in the drive speed of the potter's wheel. The motor is appropriately positioned on the platform so that when pressure is released from the pedal the weight of the motor swings the platform and motor in the speed decreasing direction and into an at rest position in which the drive cone is withdrawn from contact with the drive disc.

The potter's wheel is free to be turned by hand when the drive cone is disengaged from the drive disc, i.e. it is free wheeling. Thus, the drive can be disengaged and the wheel used for decorating (e.g. carving or glazing). The wheel is turned by hand as rotation of the product is needed. The motor is allowed to continue running to avoid life shortening starts and stops.

Other features and advantages of the drive mechanism will be apparent from the description of a preferred embodiment of the invention which follows:

## BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a pictorial view of a potter's wheel taken from above and looking towards its front and one side, with portions of the exterior housing cut away to show an embodiment of the drive mechanism of this invention;



FIG. 2 is a side elevational view of the potter's wheel and its drive mechanism, with the housing omitted; and

FIG. 3 is an enlarged scale fragmentary view of the drive mechanism, including a solid line showing of the drive cone making a small diameter circle of contact with the drive disc and a broken line showing of such drive cone making a large diameter circle of contact with the drive disc.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

The potter's wheel **10** is affixed to the upper end of a vertical shaft **12** which is supported by spaced apart bearings **14.** The bearings **14** are mounted on frame portions **16, 18** of a housing or cabinet **20.**

According to the invention, the drive mechanism for the potter's wheel includes a drive disc **22** which is secured to a lower portion of the vertical shaft **12.** Drive disc **22** includes a flexible peripheral edge portion **24.** Drive disc **22** may be made from a disc **26** of flexible material which is secured to a rigid backup plate **28.** Plate **28** may be substantially identical in form to the potter's wheel **10.**

The drive mechanism also includes a drive cone **30** which is rotated by an electric motor **32.** The motor **32** is mounted onto a platform **34** which is mounted for pivotal movement about a horizontal axis **36.** A foot pedal **38** or the like might be provided for pivoting the platform **34.** Cone **30** includes a convex drive surface which in the axial or longitudinal direction is of circular curvature.

According to an aspect of the invention, the center of curvature of the drive surface of the drive cone **30** coincides with the pivotal axis **36.** Thus, pivotal movement of platform **34** moves the drive surface along a circular curve (FIG. **3**). The flexible periphery **24** is deflected some when it is in contact with the drive cone **30.** the material used is stiff enough so that when it is deflected it is self biased into contact with the drive cone **30.** The force of contact of the drive surface with the flexible periphery **24** does not change but the diameter of the circle of contact of drive cone **30** with the flexible periphery **24** does change. As a consequence, the drive speed of the drive disc **22,** and hence the potter's wheel **10,** also changes.

As best shown by FIG. **3,** the drive disc member **26** may be beveled at **40** where it makes contact with the curved surface of the drive cone **30.** Also, the point end of the drive cone **30** is rounded so that it can cam the flexible portion **24** into a deflected position without cutting into the material used for part **24.**

According to another aspect of the invention, the motor **32** is mounted to be offset from the pivotal axis **36** on the side thereof opposite the drive disc **22.** This is done so that the weight of the motor **32** will serve to rotate the platform **34** into an at rest position in which the small diameter end of the drive cone **32** is contiguous the drive disc **22.** When the drive motor **32** is at rest the drive cone may be removed from actual contact with the drive disc **22,** i.e. the drive mechanism may be in a neutral or a non-drive position.

Referring to FIGS. **1** and **2,** the cabinet frame may comprise a pair of parallel frame members **44, 46** between which a shaft **48** extends. The motor support platform **34** may include a pair of depending arms **50**

to which the shaft **48** is secured. Shaft **48** may include end portions which project outwardly beyond members **50** and through openings in the frame members **44, 46.** Shaft **48** may be rotatable relative to the frame members **44, 46** and the members **50, 34** may be fixed relative to the shaft **48** so that they move with it. A pedal support arm **52** may extend outwardly from one of the members **50** and support a foot pedal operated lever **38** at its outer end.

The cabinet **20** encloses the drive mechanism **22, 30,** 32, etc. and hence protects it against most of the drippings from the product on the potter's wheel **10.** However, one advantage of the drive mechanism of this invention is that it can receive dripping off from the product on the potter's wheel **10** and still function properly. Another advantage of the potter's wheel drive of this invention is that the potter can control the speed of rotation of the potter's wheel both at the potter's wheel and at the drive mechanism. The potter places his hands on the clay product which is being turned by the wheel **10.** The pressure exerted by the potter on the product constitutes an increase in load and tends to slow down the wheel **10.** The drive mechanism is not harmed by this increase in load because the drive is a frictional drive. If the pressure applied by the hands exceeds a predetermined value, slippage will occur between the drive cone **30** and the drive disc **40.** If the resulting slow down is objectionable the potter can easily and quickly increase the potter's wheel speed to the desired level by an adjustment in position of the drive cone **30,** so as to increase the diameter at the ring of contact of the drive cone **30** with the drive disc **24.**

Although the invention has been described in a preferred form with a certain degree of particularity, it is to be understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination arrangement parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

**1.** In a potter's wheel having a generally vertical drive shaft, a rotatable turn table at the upper end of said drive shaft, bearing means supporting the shaft for rotation, an improved variable speed friction drive mechanism comprising:

a drive disc connected to the shaft below said turn table, an electric motor including an output shaft, a drive cone secured to said output shaft, said drive cone having a base portion of a relatively large diameter and reducing in diameter from said base outwardly to a tip at a rate resulting in the drive surface of the drive cone being of circular curvature axially of the drive cone, with the drive surface of the drive cone being contactable with a lower peripheral portion of the drive disc, means mounting said motor for pivotal movement about a horizontal axis which extends transversely of the output shaft axis, said axis being located radially outwardly from the axis of rotation of the vertical drive shaft and below the drive disc, between the drive motor and the drive disc, and substantially at the center of axial curvature of the drive cone, so that the weight of the drive motor tends to rotate the drive cone in a direction placing the tip of said drive cone contiguous the periphery of the drive disc, and control lever means for pivoting the motor about said generally horizontal axis, for moving the drive cone axially, so as to change the diameter of a circle of contact of the drive cone with the drive disc, to in that manner change the drive speed of the drive disc by the drive cone, and wherein the drive cone is made from a relatively hard material and the drive disc comprises a flexible peripheral portion which is deflected some when it is in contact with the drive cone, said flexible peripheral portion having sufficient stiffness so that when deflected it is self-biased into friction contact with the drive cone.

**2.** A potter's wheel according to claim **1,** wherein said drive disc comprises a first rigid disc of a first diameter and a coaxial and contiguous flexible second disc of a larger diameter, and wherein the portion of the second disc which is disposed radially outwardly of the first disc constitutes the flexible peripheral portion of said drive disc.

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