J. A. & B. A. JEFFERY.

APPARATUS FOR USE IN MANUFACTURING ARTICLES OF CERAMIC MATERIAL.

APPLICATION FILED MAY 14, 1914.

1,223,792.

Patented Apr. 24, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

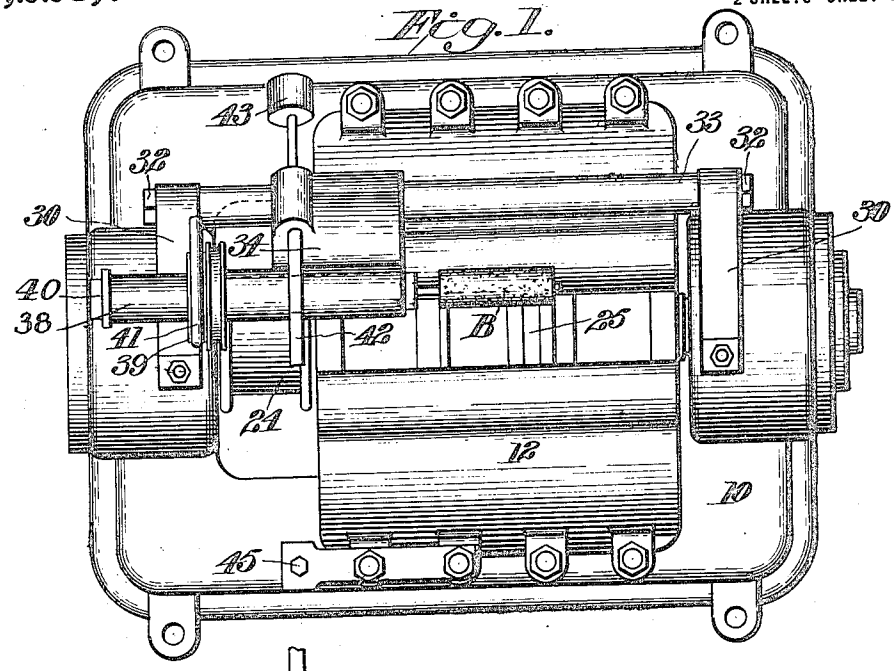
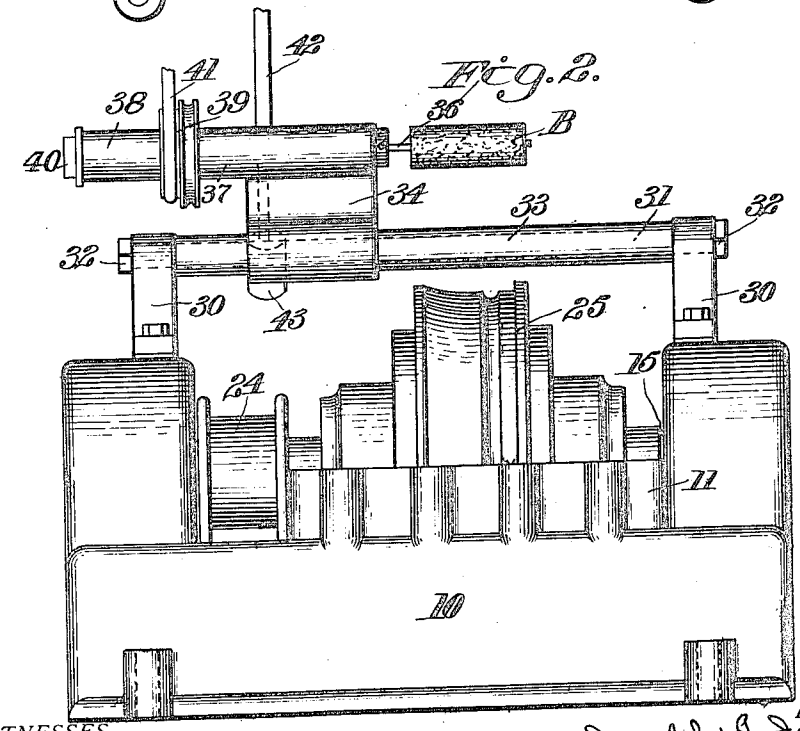


Fig. 2.



WITNESSES.

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Fig. 3.

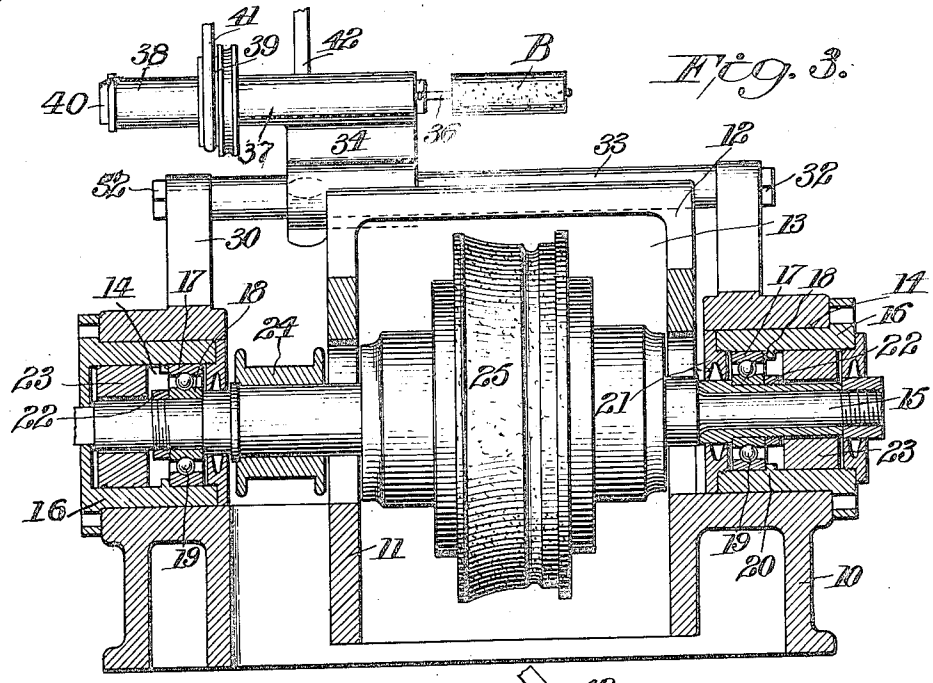
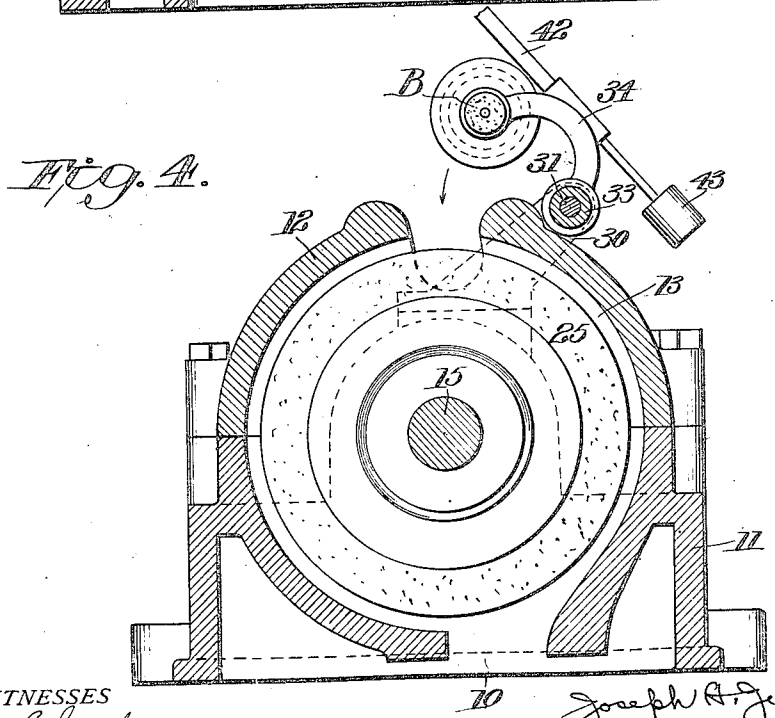


Fig. 4.



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APPARATUS FOR USE IN MANUFACTURING ARTICLES OF CERAMIC MATERIAL.

1,223,792. Specification of Letters Patent. Patented Apr. 24, 1917.

Application filed May 14, 1914. Serial No. 838,593.

To all whom it may concern:

Be it known that we, JOSEPH A. JEFFERY and BENJAMIN A. JEFFERY, citizens of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Apparatus for Use in Manufacturing Articles of Ceramic Material, of which the following is a specification.

This invention relates to improved apparatus for use in manufacturing blanks of ceramic material.

Heretofore in the manufacture of porcelain articles such as spark plugs, insulators, faucet handles, and the like it has been the common practice to place a mass of the plastic clay upon a rapidly revolving table, the material being roughly shaped by hand to the desired form so as to provide blanks. Said blanks are allowed to stand until they reach what is known as "green" or half hard condition. This preliminary shaping is known as "throwing." The blank while in the "green" state is brought to the finished shape by being placed upon a turning lathe, the desired contour being imparted by means of suitable tools held in the hand of the operator, or otherwise positioned over the clay. After turning, the blank is allowed to dry, and then is dipped into a suitable glaze, after which it is usually placed in a kiln and fired. This practice results in a great percentage of loss by reason of the fact that after being shaped the material has to be allowed to become "quite hard" or "bone dry" before being placed in the kiln for firing. Furthermore, a considerable variation in the dimensions of the finished or fired ware results from the fact that there is no accurate means of determining the exact time when the blank has reached the "green" condition, this condition depending, as it does, on the amount of water or moisture the blank may contain. Consequently, few if any of the blanks contain the same percentage of water or moisture when turned or given the desired contour, and when placed aside to dry before firing, a considerable variation of the dimensions will result, and accordingly a large percentage of variation in the dimensions of the finished ware must be expected. It is obvious that skill of the highest order is required for both the throwing and the turning operation, and usually in the process of turning the piece is so shaped that the cross section of some parts is much heavier and more massive than the others. In some instances cracks are formed in the drying process, and in others a settling and warping occurs, due in the first case to the light sections drying more rapidly than the heavier; and in the second case, the weight of the blank compressing the lighter sections unevenly.

One of the objects of the present invention is to overcome the objections above set forth by the provision of simple and improved mechanism for quickly and accurately shaping the blank. A further object is to provide improved means for presenting the blanks to the shaping mechanism and supporting the same while being acted upon by the latter.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawing:—

Figure 1 is a top plan view illustrating our invention. Fig. 2 is a front view with the top of the casing removed. Fig. 3 is a longitudinal sectional view. Fig. 4 is a transverse sectional view.

Referring to the drawings, 10 designates a base supporting a casing 11 provided with a removable top or cover 12, said casing being provided with an enlarged middle chamber 13 and end chambers 14. The end chambers 14 provide housings for the bearings which support the shaft 15. Each bearing comprises a sleeve 16 inserted within its chamber or housing 14 and carrying a bearing ring 17 complemental to a bearing 18 encircling a reduced portion of the shaft, balls 19 being interposed between said rings. The ring 17 is held in place by a shoulder 20 and a nut 21 engaging sleeve 16, and the ring 18 is held in position by a second nut 22. The space between the nut 22 and the outside wall of the sleeve 16 is filled by a block 23. The form of bearing above described is used for illustrative purposes only as it is obvious that any form of bearing may be employed, as desired. Keyed or otherwise secured to the shaft 15 is a drive pulley 24 which receives its power from any suitable source, not shown. Secured to the shaft 15 is a grinding wheel 25 the periphery of which is provided with a contour capable of imparting the desired shape to the blanks. In this connection it will be noted that we have illustrated the

grinding wheel 23 as of a design intended to shape porcelain insulating blocks for spark plugs. It is obvious however, that any other contour may be employed and that the use of our invention is not limited to the manufacture of spark plugs.

Secured to the tops of the end chambers 14 are supporting arms 30 provided with holes or openings to receive the ends of a rod 31, said rod being secured in position by means of suitable nuts 32. Rotatably mounted on said rod is a sleeve 33 which is passed through and secured to one end of a curved carrier 34, the other end of said carrier being provided with a bore to receive the shaft of a rotatable chuck 36, said chuck shaft extending parallel with shaft 15. The chuck supporting end of the carrier is provided with a lateral sleeve or extension 37 on which is rotatably mounted the hub 38 of a belt pulley 39, said hub being elongated and connected with the spindle of the chuck by means of a suitable securing device 40. The pulley 39 is rotated by means of a belt 41 receiving power from any suitable source, not shown. Projecting forwardly from the forward end of the carrier 34 is a handle 42, said handle preferably comprising a rod engaging a suitable socket in said member. A counter weight 43 is also provided tending to swing the carrier on its pivotal support to hold the forward end in a normally raised position.

In practice, the blank B is placed upon the chuck 36 while the carrier is raised. After placing the blank on the chuck the operator grasps the handle 42, moving the forward end of the carrier downward, bringing the blank into engagement with the periphery of the grinding wheel 25, suitable pressure being applied to the handle to cause the surface of the blank to be worn away until it assumes the desired contour. In order to prevent the blank from being pressed too far, an adjustable stop 45 is provided for limiting the movement of the handle 42. As soon as the blank has been reduced to the desired diameter and contour the pressure on the handle is relaxed and the carrier is raised by the action of the weight 43. The operator may then remove the finished blank and substitute a new one, after which the foregoing operation is repeated. Thus it will be seen that the blanks may be first allowed to become quite dry before being shaped, and the shaping may be quickly and accurately performed. As a result the variations in the dimensions resulting from the old practice hereinbefore described are eliminated and the product is more uniform in character and free from imperfection.

Having thus explained the nature of our invention and described an operative manner of constructing and using the same, although without attempting to set forth all of the forms in which it may be made, or all of the forms of its use, what we claim is:—

1. An improved apparatus for shaping blanks of ceramic material, comprising a rotatably supported pattern wheel contoured to shape the longitudinal surface of a blank, a blank-supporting chuck rotatably supported upon an axis parallel with the axis of rotation of said pattern wheel, means by which the chuck may be moved laterally and substantially radially with respect to the pattern wheel to bring the longitudinal surface of the blank into contact with the pattern wheel, and means for simultaneously rotating the pattern wheel and the chuck while the blank is in contact with the pattern wheel.

2. An apparatus for shaping blanks of ceramic material comprising a rotatably supported pattern wheel contoured to shape the longitudinal surface of a blank, a rod supported parallel with the axis of rotation of said pattern wheel, a sleeve mounted to oscillate upon said rod, a carrier attached to said sleeve, a blank supporting chuck rotatably supported by said carrier and rotatable upon an axis parallel with the axis of rotation of said pattern wheel, means by which the carrier may be moved to bring the longitudinal surface of the blank into contact with the pattern wheel, and means for simultaneously rotating the pattern wheel and the chuck while the blank is in contact with the pattern wheel.

3. An improved apparatus for shaping blanks of ceramic material comprising a rotatably supported pattern wheel contoured to shape the longitudinal surface of a blank, an oscillating member mounted adjacent said pattern wheel, a carrier attached to said oscillating member and offset with respect to said pattern wheel, a blank supporting chuck rotatably supported by said carrier and rotatable upon an axis parallel with the axis of rotation of said pattern wheel, means by which the carrier may be moved to bring the longitudinal surface of the blank into contact with the pattern wheel, and means for simultaneously rotating the pattern wheel and the chuck while the blank is in contact with the pattern wheel.

4. An improved apparatus for shaping blanks of ceramic material comprising a casing, a pattern wheel inclosed by said casing and contoured to shape the longitudinal surface of a blank, arms attached to said casing, a carrier pivotally supported by said arms, a blank supporting chuck rotatably supported by said carrier and rotatable upon an axis parallel with the axis of rotation of said pattern wheel, means by which the carrier may be moved to bring the

longitudinal surface of the blank into contact with the pattern wheel, and means for simultaneously rotating the pattern wheel and the chuck while the blank is in contact with the pattern wheel.

5. An improved apparatus for shaping blanks of ceramic material comprising a case, a pattern wheel rotatably mounted within said casing and contoured to shape the longitudinal surface of the blank, arms attached to said casing, a rod supported by said arms, a sleeve mounted to oscillate upon said rod, a carrier attached to said sleeve, a blank supporting chuck rotatably supported by said carrier and rotatable upon an axis parallel with the axis of rotation of said pattern wheel, means by which the carrier may be moved to bring the longitudinal surface of the blank into contact with the pattern wheel, and means for simultaneously rotating the pattern wheel and the chuck while the blank is in contact with the pattern wheel.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JOSEPH A. JEFFERY.
BENJAMIN A. JEFFERY.

Witnesses:
M. C. DEWITT,
R. W. GREEN.